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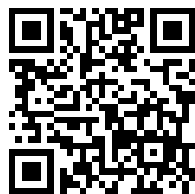
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# THE GARDENER

AND

## PRACTICAL FLORIST.

THIRD VOLUME.

1844.

*"Gardening is the most rational of all recreations. It teaches forethought, industry, and economy of time. It exalts the mind, invigorates the frame, and constantly reminds us of the great God, whose hand is imprinted on every leaf, and who, in his bountiful goodness, rewards us with the fruits of the earth. To teach the cottager to manage his garden is to lead him to happiness; to induce the higher classes to love flowers, is to find them innocent gratification, and provide employment for thousands."*

LONDON:  
RICHARD GROOMBRIDGE,  
PATERNOSTER ROW.

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THOMAS HARRILD, PRINTER, SILVER STREET,  
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## P R E F A C E.

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THE completion of a Third Volume brings us once more before our readers, and we trust without having to apologize for broken promises, or accounting for any material deficiencies.

Our first aim was to be useful, and we believe few subjects that it was advisable to entertain have been allowed to escape us, and though circumstances arise which cause us occasionally to deviate from the plan we lay down for ourselves, such deviations only change our purpose for the time; they do not make us less acceptable.

As a Miscellaneous Work on Practical Horticulture and Gardening in general, we trust we may claim to stand at the head of the periodical Garden Literature, and in progressing with our task, we have reason to hope we have provided new strength in some important departments, and especially in that of embellishment.

We have little more to do here than point out our Table of Contents, as a proof of what has been done, and to assure our readers that it will be our first object to make the volume for 1845 surpass the present.

*December 1, 1844*



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# PRINCIPAL METROPOLITAN FLORISTS & SEEDSMEN.

Ansell, Thomas, Pancras Road.  
 Back, Hornsey Road.  
 Batt and Co., 412, Strand.  
 Bax, T., Bishopsgate Street Within.  
 Beck, Henderson, and Co., 67, Strand.  
 Bristow, Knightsbridge.  
 Brown, Hampstead Road.  
 Brown, Stoke Newington.  
 Buchanan, Camberwell.  
 Buck, Portland Town.  
 Buck, C., Keppel Street, Chelsea.  
 Buck, Blackheath.  
 Bunney, Terrace, Covent Garden.  
 Bunyard and Metcalf, City Road.  
 Buxton, J., Wandsworth Road.  
 Carter, James, 238, High Holborn.  
 Chandler and Son, Wandsworth Road.  
 Chandler, G., 2, Edward St., Westminster-rd.  
 Charlwood, G., Tavistock Row, Covent-gdn.  
 Child and Field, 119, Lower Thames Street.  
 Catleugh, W., Han's Place, Chelsea.  
 Clarke, 315, Oxford Street.  
 Clarke, H., 86, High Street, Borough.  
 Clarke, Bishopsgate Street.  
 Conolly, J., Acre Lane, Brixton.  
 Cormack and Sons, Covent Garden.  
 Davies and Co., Gt. Dovor Road, Borough.  
 Dawson and Sons, Acre Lane, Brixton.  
 Dennis, King's Road, Chelsea.  
 Denyer, Loughborough Road, Brixton.  
 Dickson's, Acre Lane, Brixton.  
 Elliott, Putney.  
 Fairbairn, James, Clapham.  
 Farnes, C., St. John's Street, Smithfield.  
 Flannagan, Mansion House Street.  
 Forrest, Kensington.  
 Fowle, James, New Bridge Street, Vauxhall.  
 Franklin, J., Cottage Place, City Road.  
 Frazer, Lea Bridge Road.  
 Fryor, T., Camberwell.  
 Gaines, N., Battersea.  
 Gaines, W., Covent Garden.  
 Garvie, Stratford, Essex.  
 Gibbs, G., Down Street, Piccadilly.  
 Gibbs, T., and Co., Piccadilly.  
 Glendinning, Turnham Green.  
 Gordon and Co., 25, Fenchurch Street.  
 Gray, Son, and Adam, Kensington Road.  
 Groom, H., Clapham.  
 Gower, Bayswater.  
 Hall, E., King's Road, Chelsea.  
 Harding, T., South Island Place, Clapham-rd.  
 Hay, Anderson, and Co., Newington Butts.  
 Halley, Blackheath.  
 Henbury, Croydon.  
 Henchman, Edmonton.  
 Henderson, Pine Apple Place.  
 Henderson, Wellington-rd., St. John's Wood.  
 Higgins, J. & F., St. John's Wood.  
 Hopwood, J., Bayswater.  
 Hurst & McMullin, Leadenhall Street.

Ibbet, Woolwich.  
 Imms, Woolwich.  
 Ivery, W., Peckham.  
 Jackson, Kingston, Surrey.  
 Kempster, Upper Street, Islington.  
 Kendall, A., Stoke Newington.  
 Kernan, J., Russell Street, Covent Garden.  
 Kirke, J., Brompton.  
 Knight, Joseph, Exotic Nursery, King's Road.  
 Lake and Co., Bishopsgate Street.  
 Law, H., King's Road, Chelsea.  
 Lawrence, Red Lion Inn, Hampton.  
 Lee and Co., Hammersmith.  
 Little, H., King's Road, Chelsea.  
 Lockhart and Co., Cheapside.  
 Loddiges, W. and G., Hackney.  
 Low and Co., Clapton.  
 Marnock and Co., Hackney.  
 McArthur, P., Edgeware Road.  
 May, James, Tottenham.  
 Meades, Lewisham.  
 Meares, W., Davies Street, Berkeley Square.  
 Miller, Mitcham.  
 Moses, M., King's Road, Chelsea.  
 Mountjoy, W., Ealing.  
 Moodie, Highbury Nursery, Islington.  
 Nash, Adams, and Co., Strand.  
 Nash, Richmond.  
 Noble, W. and J., Fleet Street.  
 Norman, Woolwich.  
 Ottey, J., Peckham.  
 Pamplin, Hornsey Road.  
 Pamplin, Walthamstow.  
 Pawley, White Hart, Bromley.  
 Pearson, Hampstead Road.  
 Plimley, Shepherd's Bush.  
 Porter, Brixton.  
 Protheroe and Co., Leytonstone.  
 Rollisons, Tooting.  
 Ronalds, Brentford.  
 Ross, J., Stoke Newington.  
 Russell, Battersea.  
 Siggers, King's Road, Chelsea.  
 Smith, F. and A., Hackney.  
 Smith, G., Liverpool Road, Islington.  
 Smith, Hornsey Road.  
 Smith, J., Covent Garden, and Dalston.  
 Stein, Highgate.  
 Stevens, Harrow Road.  
 Syred, Edgeware Road.  
 Tate, R., Tyndale Place, Islington.  
 Thatcher and Son, Hedge Row, Islington.  
 Trinder, Forest Hill, Sydenham.  
 Tuck, James, Sloane Street.  
 Turner and Shephard, New Bond Street.  
 Turner, M., King's Road, Chelsea.  
 Videon, Maida Vale.  
 Waite, Eyre Street Hill.  
 Warner and Warner, Cornhill.  
 Whitley and Osborne, Fulham.  
 Wrench and Son, London Bridge.



# THE GARDENER

## And Practical Florist.

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### FLORICULTURE.

THE progress of Floriculture through the season of 1843 has been steady and gratifying to all who are interested in its welfare, and we may fairly take credit for having contributed in no small degree towards improvement. That it had flagged greatly for two or three years is universally admitted, that it still "drags its slow length along" in some places cannot be denied, but in the main it has revived, and is rapidly improving. Among the causes which have led to its improvement, we believe nothing has been more effectual than our publication of the Properties which constitute perfection in various popular flowers. It has dispelled a mystery which too many professed florists kept up, and it has enabled the most humble follower of Flora to appreciate the value, or condemn the worthlessness of any flower that may be placed before him. It has familiarized the lovers of nature with nature's most beautiful productions, and that ignorance of why one variety is better than another, which was too general, no longer prevails. It is the knowledge that a coin or a jewel is genuine that makes the possessor value it above a counterfeit, which might look as well; it is the knowledge that a flower possesses one, two,

three, or more requisites, that makes the cottager appreciate it beyond those which have less or none; and we have so clearly pointed out those requisites, that a child can recognise their presence or absence. Besides this, our efforts to improve public exhibitions have been successful. Those societies which have hitherto been the most self-sufficient have been glad to profit by our hints. Our remarks on the duties of judges have made committees more careful in their choice; our censure, where it has been deserved, and our approval where it has been merited, have had their weight, and most of the societies have been induced to consider well, and to some purpose, what improvement they could make. The great object for which we have laboured, and are labouring, is to promote the knowledge, practice, and general interests of gardening. If our success in 1844 be as great as it has been in 1843 we shall be able to congratulate our readers upon having "done the state some service," for in the successful progress of floriculture may be seen the improvement of the moral, social, and religious conditions of the great bulk of its followers.

G. J.

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"ON THE TEMPERATURE OF ENGLAND, considered with reference to the different Counties, and to the Plants and Fruits suitable to each County," &c.

SIR,—THE above would indeed be a very interesting subject for a book, as the Editor of the *Gentleman's Magazine* suggests,\* but it is a subject which no single person can treat with the experience necessary for its proper elucidation. It is a subject also which requires such a variety of local information, that, even in one county, it would require more than one person to afford the necessary information with respect to temperature and plants. You seldom find the same

person a Florist or Horticulturist and a Meteorologist. The gardener can easily tell you whether such a shrub will grow well here or there, but he can very rarely tell you whether the mean temperature is the same here as there. It can only therefore be through such a manifold recipient of letters as you are, that such a scheme as the getting up of such a book can be expected to be accomplished. It is only by your correspondents in different parts of the country that the information sought for by the Editor of the *Gentleman's Magazine* can be supplied; and I trust that they will come forward voluntarily and offer it for your use. If they do not, the subject is so well worthy of being followed out, that you ought to ask them to do so. If the information be ever attained,

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\* See Vol. 2, p. 322.

I think it will be found that the possibility of growing this or that shrub in this or that county, will not depend so materially on the position of that county as on the particular part of the county, and therein, again, on the shelter, or want of shelter, from certain winds. Thus, within a circle of a few miles from any given point in any given county, you will almost certainly find one person cultivating with success one plant which another person at a very short distance cannot manage at all. And why? Probably because the successful grower's garden has higher or lower hedges or walls, or is better drained, or is drier than that of the unsuccessful one. And sometimes this success seems to depend on such trifling matters of difference between the localities, and often upon such apparently contradictory conditions, that the most skilled of gardeners cannot tell you why it is so. Thus, I cannot grow Dahlias in perfection, though I have tried all the means in my power, such as change of soil, &c.; while a nurseryman near me can grow them well enough. But he has his sheltered from the wind, mine are not, and to this cause I attribute my failure. And to this cause I imagine may be attributed many of the failures in Horticulture. I do not know, in fact, a greater enemy to plant or shrub or fruit tree than wind. There is no doubt a long list of fruit trees that will not flourish out of a certain latitude. Thus it would be folly in us here to expect ripe grapes on the open wall. There are also many shrubs which will not flower in this latitude except in very favourable seasons. But this is such a notorious fact, that it would not require a large book to make us avoid the purchase of such like. Experience makes folks wise, they say, and certainly it is by experience alone that we can arrive at the knowledge sought for by the Editor of the *Gentleman's Magazine*. No theory, as to temperature, can insure the growth of certain plants in certain latitudes of this country, for, when you come to examine the observations in detail upon which the mean temperatures are founded, you will find such differences between localities at very short distances, as will in fact destroy a plant that may happen to be within the reach of the extreme of the temperature. Thus, I call the mean temperature of this locality 48 deg., but I frequently find in winter a difference of 10 deg. between one end of my garden and the other; and tender plants will flourish for weeks or months at one end, after similar plants have been cut off at the other. I mention these things merely to show how difficult it would be to make a book about them, which should be so correct in its information, that from its pages you might learn whether a shrub you had purchased in London would grow in your garden in Cumberland or not. With all due submission, however, I think I could find a readier mode of finding out whether any particular shrub would flourish with me or

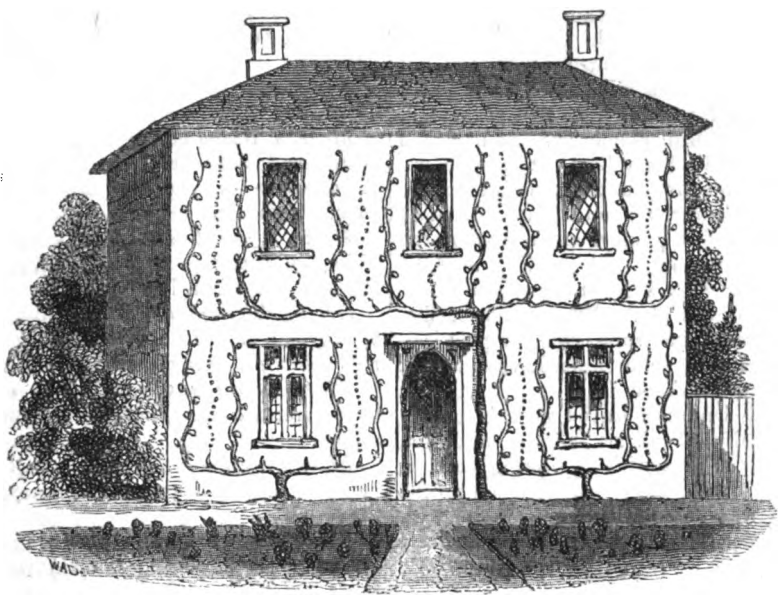
not than by reference to book knowledge. I would go to the nursery gardens nearest my own locality, and look for myself, and see if it flourished there in the open garden before I purchased it. I should never think of sending to a London nurseryman for a Magnolia, or any other shrub whatever. Notwithstanding all this, there are many very desirable points in the questions propounded by the Editor of the *Gentleman's Magazine*; and I, for one, would join him in the wish for answers to them. But whenever the answers are obtained, I think he will find that the difference of *temperature* in the various parts of England has little to do with the cultivation of plants; but that the presence or absence of moisture (as exhibited by the Hygrometer) has together with the point of the compass from which the prevailing winds come a good deal to do with that cultivation. He will find also, I imagine, that every advance south in England does not diminish the cold in winter, but that an advance to the west does diminish it. He will find also, I think, that the air in Suffolk is much drier in the summer months than that of Herefordshire, because at that season of the year the winds generally come from the west, and consequently on the west coast are more laden with moisture than when they arrive at the other side of the island. Then, again, the spring is very severe on the east coast on account of the prevalence of easterly winds which retard vegetation very much, and of course are much more severe in their effects when they first reach the island than after they have been warmed, as it were, in their progress over it. So that, if Rhododendrons do not flourish in Suffolk, but do near Highgate, the presence or absence of moisture (as the case may be) in the summer winds may be the cause of such difference. And in like manner the Mulberry may ripen better without the summer moisture and, therefore, Herefordshire may not be a suitable locality for it. Of course all this is mere supposition on my part, and I state it in this desultory way, more in the way of hints for some future commentator than as axioms on which dependence can be placed. If I could be of any assistance in carrying out the views entertained in the suggestions of the editor of the *Gentleman's Magazine*, I should be happy to render any services I may be capable of, and in the mean time remain,

Your's, &c.

JOSEPH ATKINSON.

*Harraby, Carlisle, 18th Nov. 1843.*

[We wish some other of our correspondents in different localities would turn their attention to this subject.—Ed.]



## TREATISE ON THE VINE.

WE do not propose to offer in the following Treatise much that we can pretend is new. The quantity of books, treatises, essays, and newspaper articles, which have already appeared, in all forms and at all prices, have comprised pretty nearly all that is known; but we would almost defy any one to get up, from the perusal of all that has been written, or from any one author's writings, and say his mind is made up as to the best plan he can adopt, if he desire to begin cultivating the Vine to the best advantage. We have read all and tried all that has been recommended, under various circumstances, in numerous situations, in good and bad soils, under advantages and disadvantages,—and have, after repeated trials of various systems, formed our own conclusions. We offer the following, therefore, as the best advice we can give to those who know nothing of the subject, and as the result of a fair and impartial examination of various systems, for those who are, as they imagine, already acting upon the best. Thus, while instructing those who are totally unacquainted with the subject, we shall be confirming some who are practising rightly, and improving those who are not quite so perfect as they wish to be. It may be, that our system, as a whole, may be only made up of half a dozen others; it may be, that there is not an original idea; but this arises out of the simple fact, that there are many ways of accomplishing the same end, that every writer has his faults and his excellencies, and that we who were not born a proficient in the art of gardening, but have had to learn from precept and example, and perfect ourselves by

experiment and practice, were indebted to somebody for every idea we adopted; so that we can only boast of having adopted the best points in each individual's practice, and giving a fair transcript of all we know, in a smaller and cheaper compass than has yet been attempted. If we do not give as much information for a few pence as can be purchased in any other form for half as many pounds, we shall in our own estimation have failed.

In the course of our practice we have arrived at several conclusions, which we think cannot be disputed, and upon these we found a system which we shall endeavour to make as clear as possible to the most humble capacity, seeing that the Vine is capable of being cultivated to the advantage of the cottager, on the front, back, roof, or side of his dwelling, or, if he will, in his bare garden. Our system is founded on the following conclusions:—

1. That the Vine is a gross feeder, and will flourish in the richest and fattest of soil.
2. That the Vine is impatient of stagnant or continued wet.
3. That the Vine is capable of producing a given quantity of fruit and wood in perfection, and that when it is allowed to exceed that quantity, the rusting, the shrivelling, or the non-ripening of the fruit, or other evils, or all, in their turns, are certain consequences.
4. That when a less proportion of fruit and wood than the Vine can mature be left on it, no evil consequences ensue, and therefore this extreme is preferable to the other if we err on either side.

5. The Vine bears on shoots of the present year, out of wood of the last year, and therefore care has to be taken that a sufficient quantity of last year's wood be preserved.

6. That so long as a proper quantity of last year's wood be preserved, and not too much be left to push fruit and wood, a Vine will bear; and, therefore, although there may be some modes of pruning more neat than others, and some more easily managed, so long as the Vine has not too much space to cover, too much fruit to mature, or too much wood to produce and maintain, the actual style of pruning and training may be suited to the place on which it has to grow.

7. That the roots of the Vine cannot be disturbed, nor reach into sour, cold, or poor soil, without deteriorating almost immediately the fruit and the present year's wood.

8. That the length of barren stem, before the branches are allowed to start, is immaterial, and therefore, that a Vine with its bearing wood on the roof of a house, and a bare stem all up the front, will give as fine fruit as a fellow Vine, with its bearing wood within a foot of the ground.

#### THE VINE.

As our object is to get as much useful information as possible into a small compass, we shall not give any history of the Vine. We believe that very few of the most humble, or even illiterate people in the kingdom, are ignorant as to the description of the plant, and few care where it came from, what class and order it belongs to, or how it grows in the countries most congenial to its habits,—all they wish to know, and all we intend to tell them, is,

1. Which are the best sorts to grow in the open air?

2. How to raise plants from cuttings.

3. From layers.

4. From seed.

5. How to treat them after they are raised.

This comprises planting, grafting, pruning, training, management while fruiting, treatment of the fruit, gathering, and after management.

It will be necessary to show this in the varied circumstances under which the Vine is cultivated, that is to say, on walls, on houses, on espalier frames, and on stakes in the open ground, on bad soil and good soil, wet situations and dry, favourable aspects and unfavourable. To this our aim is directed point blank.

#### BEST VARIETIES OF THE VINE FOR OUT-DOOR CULTURE.

It is quite certain that England boasts not a favourable climate for fruits that require extraordinary heat and much regularity, and therefore that there are difficulties to overcome; but there are some varieties which ripen better than others, and those which, in our estimation, are best

worth cultivating, and yield the greatest encouragement to the grower, are the following:—

**Black Hamburgh.**—Handsome black grape, with large berry, sweet flavour, and handsome bunches.

**Esperione.**—Something like the black Hamburgh, and somewhat earlier.

**Miller's Burgundy,** or Miller's early Grape.—smaller bunches and berries, and the berries set closer in the bunch. Colour, black, and flavour better than either of the above.

**White Muscadine.**—Handsome bunches—white, approaching amber when full ripe. Berries fine and thin skinned.

**Grizly Frontignan.**—A brownish red Grape, of exquisite flavour. Berries not large; bunches, moderate size, rather handsomely formed.

**White Frontignan.**—Bunches and berries large, greenish white, high flavour, rather handsome.

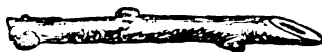
**Black Frontignan.**—Berries small and close; bunches in proportion; black, juicy, and high flavoured.

**White Sweetwater.**—Bunches handsome; berries large and close; skin thin and transparent; pulp juicy and sweet.

Others might be added, but they would be inferior to those already mentioned, and, indeed, we had some doubt whether we should mention the white Sweetwater, having already named the white Muscadine; however, the Sweetwater is an old favourite. The Black Prince might have been named, but, except in colour, it is every way inferior to the black Hamburgh, and we have mentioned quite enough for any moderate grower.

#### RAISING FROM CUTTINGS.

At the fall of the year, when autumn pruning takes place, get long cuttings of the present year's wood, and if you have the selecting of them, the nearer the ground or old wood, and the closer the eyes, the better. Let these be laid in by the heels, as it is called, that is, the lower ends laid three or four inches underground, with the long ends laying on the surface, and cover the whole with a foot of dry litter, to protect against frost, until March; towards the end of the month take up the shoots, cut the lower end, close up to the lowest sound eye or joint, and then cut it off half way between the third and fourth joints, this lowest cutting, from each length, will prove the best, and unless you really want more, you may throw the rest



away, though every three eyes or joints the whole length would make a plant. These cuttings may be placed in a bit of rich ground any where, in a sloping direction, with the top eye or joint just above the soil, and the two eyes

below it; the cut above the top joint must be sloping on the opposite side to the eye. Those who are going to plant vines to grow, should plant out the cuttings at once where they are to remain, they will grow much better and quicker than if they are first struck and then removed. Some writers recommend us to cut a piece of the old wood off with each cutting, to form a sort of heel to it, like the head of a hammer. This is perfectly useless, if not mischievous. Others, take as many cuttings as the whole length of a shoot will make. We would rather have the lowest end of a shoot, than two of the cuttings from above it, from a conviction that in a general way they bear sooner and better than those above, and do not run so much to wood, and that the further we go from the heel for a cutting the worse it is. The cuttings thus planted, whether in the place they are to grow, or a place from which they are to be afterwards removed, require the same attention. If more than one shoot appear, the weakest must be rubbed off, and only one—the strongest—be allowed to grow. This must be supported by being nailed to the wall, or tied to a stake, as the case may be, and the points of the lateral or side shoots must be taken off, that all the strength may be thrown into the main shoot; frequent waterings must be given. Some recommend with soapsuds or liquid manure, but if the ground has been properly made, it is useless, though if necessity has compelled you to put the cuttings in poor soil, liquid manure will assist, and the best is sheep's dung. The next is decomposed neat's dung, but if neither can be had, decayed melon bed. The best way to keep this handy is to put a pailfull of sheep's dung into a tub with nine pailfull of water, and stir it well up every day before you use it: never let the ground be dry until the shoots are a foot long; but let it be understood, that if we were going to plant a wall, or a row for espaliers or stakes, we should plant two cuttings within a foot of each other at every place we wanted a vine, and when they had made their growth, if both succeeded, (which in nine cases out of ten they would,) we should remove the weakest, and let the strongest remain, and by all means we should use a cutting in preference to a plant.

#### GRAFTING THE VINE.

Of all the many ways that have been promulgated for grafting, we have rested all our hopes on three only—the grafting upon last year's wood, with last year's wood of the same thickness; the grafting of last year's wood underground; and inarching of the present year's green shoot upon the present year's shoots of the Vine. The first we practised at the recommendation of Mr. Gowan, a correspondent of the *Gardeners' Gazette* in its early days, and succeeded admirably. We give the directions

in his own words, selected from a very interesting paper on the Culture of the Vine generally.

"Select a scion with one eye, and cut it in the form of a wedge. For a stock, select a shoot of the preceding year, about the same thickness as the scion, and cut it over a little above the second eye from the old wood. With a sharp knife cut it down the centre nearly to the old wood. Out of that half of the stock which is opposite to the eye or bud, pare with a penknife as much as is necessary to make it fit the cutting on the sides of the scion. Insert the scion with its eye opposite to that left on the side of the stock. Tie it up and clay it over in the usual manner, with this difference, that you cover nearly the whole of the scion with the clay, leaving only a small hole for its eye. Tie a little moss over the clay, upon which sprinkle a little water occasionally, to keep the whole in a moist state for some time.

"What I think of essential importance to success in this method, is to leave the eye or young shoot on the top of the stock, and allow it to grow for a few days, when it should be cut off, leaving only one eye and one leaf to draw sap to the scion, till it be fairly united to the stock.

"With regard to the time for grafting, I find that it will succeed pretty well when the stocks are about to break into leaf. But I think there is more certainty of success, when the shoots of the stock into which the grafts are to be inserted, have made four or five eyes of new wood. By this time the sap has begun to flow freely, and the danger of the stocks suffering from bleeding is over."

The great advantage of this method is, that the union is as complete, and the growth as rapid, as that of any other shoot on the same Vine—that is to say, if the new variety, be so rapid a growing one as the old one which forms the stock. The second plan I first adopted at the suggestion of the author of the "*Domestic Gardener's Manual*," and it must be dexterously performed.

A plant of the variety required is procured in a pot, and set in the same house as the Vine it is to be grafted on, by the inarching operation. Place the pot so that its shoot shall grow the same way as that in which it is to be inarched, then with a very sharp knife cut away one side of the shoot of the Vine, about or near half through, then cut the side of the pot shoot that is next the Vine shoot, where it is the same thickness, the two flat portions being fitted so



that the barks of both meet, at least on one side, are tied together with bass, and protected for a time with damp moss, tied loosely round the

place where they meet. This can be done at any part of the Vine; but if it be proposed to sacrifice the original variety altogether, and replace it with the new, the place where the inarch is performed should be as near the bottom as possible, for which purpose, the old Vine should be cut very considerably in, to encourage shoots as low down the old wood as possible. Few people like to lose the crop of fruit the year they graft, but the more of the Vine they cut away, the more likely they are to obtain shoots low down the trunk. When the graft has united, the tie must be undone, and the whole loosened, but it may be still desirable to keep it on a while.

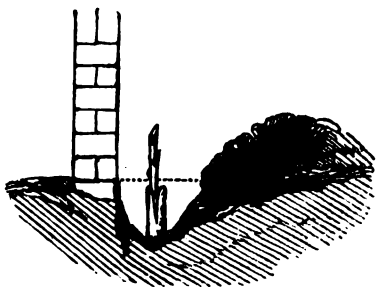
We took no particular pains, and did not find much difficulty, in the operation, but habit, perhaps, made us moderately dexterous, and an amateur may find some difficulty. The author of the hint gives the directions somewhat more particularly than we do, and should be allowed to speak for himself. He says:—

“Inarching *with*, and *on*, the green wood may be relied upon; all that can be required are one or more healthy plants, in pots, of the varieties to be substituted, each with a good green shoot, the produce of the present season; and a vigorous growing shoot proceeding from the old Vine, to serve as a stock.

“If it be the object to renew and replace a Vine entirely,—suppose, for example, the substitution of a *Hamburgh* for a *white Frontignan*. The latter is much inclined to send up strong succession shoots from the lower part of the stem, near the root in the border. Let a strong shoot—a third of an inch thick, a yard long, firm in texture, though quite green and juicy—be taken for the stock; it may be, perhaps, a month or five weeks old. In a twenty-four sized pot there shall be a young *Hamburgh*, raised last year, cut down in February, and having in May a green shoot two feet long, and as thick as a goose-quill. Place these two green shoots side by side; lay them together in a position wherein two or three inches of each may be in close contact at the strongest part of the shoot, which will form the scion. Pass a ligature round the two, to secure the stems in this required situation; then cut off, with a small and very *sharp* knife, a portion of the stock, to include not only the bark, but some of the green (*cellular albumum*), being careful to match the breadth of the slice, as correctly as may be, with that of the pot scion, which then is to be cut one-third through its substance. The length of the slice to be removed from each should not be less than two or three inches, and as soon as the removal of the bark has taken place, the wounded surfaces should be brought closely together, (the bark of one side, at the least, touching to the full extent of the cut), and the ligature passed firmly and flatly round the stems.

We do not recommend this plan, except when

the other has failed, or we begin to think of grafting when too late for the other mode. The third plan of grafting is performed on that portion of the stem of a Vine which is underground. The earth is dug away, the Vine cut off, and the graft is performed in any of the ways which the operator can do best, and with least difficulty. It is best adapted for suckers or shoots which come from the root, and the nearer it is to the size of the scion, the better the fit



can be made. Where Vines are well established and the stem is thick, the cut must be made on one side of the stem, the graft neatly fitted, so that the barks join each other, and being tied there, the mould is earthed up to the single eye that is just above the ground.

We might stretch out this treatise indefinitely by mere quoting authorities in confirmation of our practice, but we are not in the habit of seeking such aid. What we know we can state with confidence, and leave the results to speak for themselves to those who follow our advice. We have no object in mentioning other names, but that of giving them credit for having furnished the idea upon which we founded our practice. Thus, Mr. Gowers is mentioned as having furnished, in the columns of the *Gardeners' Gazette* (that great repository of valuable information), the idea upon which we commenced grafting most successfully, and the author of the “*Domestic Gardener's Manual*,” another contributor to the same columns, gave us an idea of grafting by inarching the green shoots of the present season, which we are quite sure we should not have thought of, but which we found invaluable in one respect. We have sown the seeds of raisins at Christmas, inarched the seedling plant in May, and in two years afterwards had the fruit. The great object of grafting is to change the fruit of established Vines, and when the growth is healthy and vigorous, it is well worth attention, because it is evidently possible to calculate on fruit the very year the grafting is performed, if you happen to select a graft with a fruit bearing bud. The grafting of ripened wood upon ripened wood affords the best opportunity that could be imagined for obtaining new varieties of fruit on old Vines, without losing a season, because the old portion need not be removed any faster than the new supplies its place, and if any thing happens that you miss the



season, you can have recourse to the grafting of the green wood by inarching, which has this advantage—if it do not take properly, your plant in the pot is not lost, but, on the contrary, the two or three eyes which are below the place cut will enable you to adopt the grafting with the ripened wood in the spring of the next year. The authors, or rather the practitioners, of these two systems, once had rather an angry discussion upon the merits of the two systems, but neither party succeeded in detracting from the other.

In grafting the Vine, as in all other kinds of grafting, we are not wedded to any one kind of join, but, on the contrary, would care as little about the actual plan, as we should at the splicing of a broken stick, the grand objects are a clean cut, and a close fit, and quickly performed, to give the juices no time for drying.

Of the success of this mode of grafting, by inarching the green wood. Mr. Towers, a thorough practical man says in the *Gardeners' Gazette* of July 21, 1838.

“Of the success of inarching, proof was given in the instance of the *fruitful Constantia*. As to further unvarnished facts:—At different periods of the spring of 1837, six very slender shoots of Hamburg and Frankenthal vines, according to the proper state of the wood, were inarched upon a Hamburg and a white Frontignan stock. A Frankenthal upon the former has extended side by side with a parallel shoot of the stock, nearly eighteen feet, of which one-half of the wood is ripe, with buds like peas in size. A Hamburg upon a low shoot of *Frontignan* has produced twenty or more feet of strong rod, and its growth gives promise of very much increased length. Four *subsidiary* shoots of the same plant support inarches of excellent wood, one bearing a bunch of grapes; another inarch has been formed during the present spring, and is growing strongly, though detached from the parent: and with all this, not one particle of wood has been cut away from the main spurred rod of the white *Frontignan*; that has borne its crop untouched. Had it been cut away, the whole power of the roots would have been exerted upon the inarched subsidiaries; and then the results would have been more striking.”

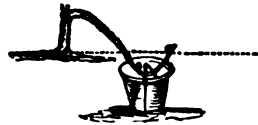
#### PROPAGATION BY LAYERS.

The layering of a Vine, or indeed of any other tree or shrub, consists of confining a portion of a branch below the surface of the soil, when it will, in the course of time, strike root from one or more of the joints or eyes so confined. Take the branch of a Vine of the last year's growth, long enough to reach under the surface, remove the soil three inches, bend down the shoot so as to pin down and confine two eyes under the soil. This is easiest done by a stick, cut with a hook to it like a walking-stick, and above a foot long, to thrust into the ground

to hold the branch fast down. The last eye, before it reaches the ground, should be cut away, so as to prevent its growing, and the eye next above the soil beyond where it is pegged down is depended on for the shoot that is to make the plant, and all beyond it should be cut away, as per example shows:—



1, the old Vine; 2, the last bud before the layer dips into the soil, and which should be cut away; 3, the peg that keeps down the bent branch and two of its buds under the soil; 4, the cut which should be made above the bud nearest the surface, after it comes out of the ground; 5, the bud which is then the only part left to grow; 6, the dotted line to indicate the surface. But the objection to this practice is, the disturbance of the soil to get up the plant after it is struck, because the roots entangle with those of the parent Vine. To obviate this, a pot may be sunk two or three inches below the surface, and the Vine be pegged down, so that both eyes are compelled to strike into the pot which confines the roots, and by separating the plant from the parent at the end of August, and planting it where it is to remain, without breaking the ball or disturbing the root, the plant may not be much worse than a cutting, but give us a cutting for choice before the best layer that was ever produced. In this case, the plant keeps growing, and must be fastened to the wall, or to a stake or espalier frame, as the case may be, and must be kept moist with liquid manure, from the time it is planted out till the leaves all but fall.



RAISING FROM EYES.

An eye can be sometimes obtained when enough for a graft cannot, and when, if it could, you might not have a vine on which to place it. There are, also, many who seek to raise plants of a new variety, for the purpose of disposing of them in exchange or otherwise. It is clear in such a case that for every cutting which must have two eyes, and ought to have three, two or three plants might be raised from single eyes, which are cut with not more than half an inch of wood to them. These, then, should be placed in pots, say of rich loam and dung, in January or February, and placed in a common hot bed or the stove, whichever is most handy. Some put three or four in a pot, and when they have

shot six inches, change them into pots of 48 to the cast. They must now be placed in the stove or greenhouse, and be supported by sticks or lines, or trellis, or wall, as they will frequently grow ten or twelve feet in a season; in July they should be turned out. This, be it remembered, is to supply plants for transmission from one place to another, and not with any view to use them yourself, because, as we have before shown, you cannot do better than plant cuttings when you want them.

To show how far the vine is capable of growing in a single season, the following instance is related by Mr. Simpson, gardener to John Hustler, Esq.:—

"A vine in the garden of John Hustler, Esq., Undercliffe, near Bradford, last year increased in the dimensions of its wood one thousand two hundred times. This, to some of your readers, at first sight may appear incredible, but the following explanation will tend to establish the fact:—

"This vine was raised from a single eye, the cutting not more than half an inch in length, planted in a pot six inches diameter, along with three more, January 7, 1837, in light sandy soil. As soon as they attained the height of six inches, the above vine was placed in a pot five inches in diameter, using rich sandy soil. On the first day of June, having made a shoot from six to eight feet in length, it was planted out in its permanent situation, the border composed of light rich soil; this vine made a shoot above fifty feet in length, and two inches in circumference, the same season as put in a cutting, 1837. It was pruned December 30, 1837; the wood firm and well ripened, and calculated to bear a large quantity of grapes the ensuing season: sort of vine, Black Hamburg.

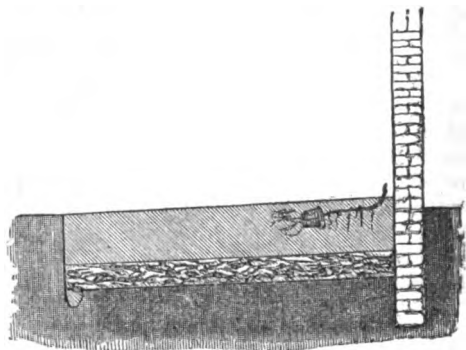
"In the same house, and alongside of the above, is planted a White Tokay vine, which made a shoot seventy feet in length, and perfected four fine bunches of grapes the same season as planted, in 1835. The second year, 1836, this vine showed abundance of fruit, which was cut away, except twenty of the most promising bunches, which ripened well, and the vine made very strong wood. The third season, 1837, this vine produced thirty bunches, having thinned out several dozens of clusters in a young state: this vine is now very luxuriant, and has a stem from twenty to thirty feet in length, measuring above six inches in circumference. When planted in 1835, this vine was an ordinary sized plant, having had two years' growth from a single eye.

"In the situation which I now hold, I lately took down four houses devoted to the growth of vines, pines, &c., destroyed the old vines, rebuilt the houses in a more favourable situation, made fresh borders, and planted young vines, ordinary sized plants, from the nurseries. This was done in the years 1834 and 1835, both built and

planted in each season. The vines the first season generally produced fruit, and made shoots from one-half to two inches in circumference, which were allowed to mature from twenty to forty bunches each the second year, and the following seasons have thrown out from each bud or joint generally from two to four, and even as far as ten clusters."

#### MAKING BORDERS.

In making the borders for Vines, we have to keep in mind the necessity of complete drainage, and this must be effected by means adapted to the situation. If the border be next a house or wall, it ought to be ten feet wide, and the drain be made at the edge furthest from the wall; the entire soil should be dug out three feet deep in front, and two feet six inches next the wall; a drain, six or eight inches deeper, should go along the front, and the water be got rid of some where; such a drain, running right through a garden, would be beneficial, but to grow grapes in perfection, that or its equivalent is necessary. Upon the bottom of this excavation put one foot thickness of brickbats, stones, broken pots, and all kinds of rough stuff, taking care that the drain or gutter in front be covered over with tiles, or that none but large pieces that will lay loosely, or faggots, or some other material that will keep a free current for the water, be laid in the hollow, and that the foot thickness which is covered over it be rough open stuff. This bottom secures a perfect drainage. Then make up your compost for your border, *if it must be all new*, with rich loam, turfs, bones, leather cuttings, horn shavings, farriers' waste,



waste rags, bits of carpet, or any other material, one half being loam, and one fourth decomposed dung, and the other fourth a mixture of all, or such as can best be got at; all we wish to impress upon the mind is, that animal substances, either fresh, or in a state of decay, cannot be misapplied when put to the Vine border, and that they are better in large than small pieces—whole bones are better than bone dust or bruised bones—and if broken pots, tiles, or bricks, are among the compost, it is all the better, as the roots run through it with greater

facility. Gravel, road scrapings, are also good. This mass being mixed and chopped up together, may be filled in upon the rough bottom, two feet six inches thick all over, which will raise the border about six inches next the wall, and the front will be level with the rest of the ground. All this supposes the soil to be less dry than it ought to be, and pretty nearly as unfavourable as it can be. But, suppose the soil to be high and dry, good loam, plenty of it, and already well drained, in that case you have only to mix up with the loam, for two feet six inches downwards, by trenching, any or all of the ingredients we have mentioned, but, at all events, bones, broken pots, road drift, decomposed dung, leaf mould, or turfs, from one fourth to a half, and ten feet wide from the wall. Suppose, however, the ground lies too cold and wet to enable you to dig down much, the best way then is to lay the rubbish bottom first mentioned the depth that you can get rid of the water, which in some places during the winter months is the very surface itself, and then the border must be raised all above the surface; but this should be remembered, the Vine ought to have two feet depth of good soil, at the least, (and two feet six inches is better) and ten feet in width from the wall, so that whatever you cannot sink of the depth you require must be raised, and, if necessary, you must brick up the place to hold the proper quantity of soil, otherwise it would wash down. There may, however, be some who only want one or two Vines, and cannot command half the width required. They must make the space as large as they can, and grow them as well as they can, which, with attention, may be moderately well, but they cannot expect to do so well as those who have all the means. Those who are thus situated, that is to say, with a cottage or wall to grow a Vine on, and hardly any room for the roots, must excavate the place as large as they can, make a fair drain to get rid of superabundant wet, and fill up their excavation with the same earth, mixed, as we have described, with other materials to the extent of one fourth to one half the whole quantity used to fill up with.

#### PLANTING THE VINE.

Having shown what we should do from choice where we could obtain just such cuttings as we prefer we next come to the planting, in cases where we have to obtain the plants in pots. There is no difference in the making of the border, which we will suppose to be prepared as nearly as circumstances will allow. Any time before March turn your plant, which will be several feet long, if only a year old, out of the pot with the ball whole, make a hole about two feet six inches from the wall, and deep enough to lay the ball in, almost on its side, and the upper edge of it full three inches below the sur-

face, open the ground nearly to the wall, and with hooked pegs fasten down the plant three inches below the surface, turning it up within half a foot of the wall, cut the plant down so as to have but two eyes above the soil. The object of thus laying in eighteen inches of the plant above the root, is to increase the supply of nourishment to the plant; every eye underground will form roots, and give vigour to the shoots. Care must be taken to water them regularly, and if the ground be not as rich as you wish, use liquid manure. As the two eyes shoot, if any more than one shoot come from each, the weakest must be pulled off, and the two principal shoots then left must be supported by being nailed to the wall with a shred of cloth, which must be long enough to go loose round the stem, and allow of a nail being driven through the two ends to hold it to the wall until they are two feet long, or they earlier indicate, which takes the lead, because only one shoot and that the strongest must be allowed to grow, and as the plant grows, the same precaution must be taken with it all the season, that the wind may not damage it. All side, or, as they are called, lateral, shoots, must be pinched off just above the first leaf they make, and if there be any dry weather, the watering must be as regular and as abundant as the circumstances may call for. There must not be allowed a weed, or a plant of any sort, on any part of the border, for the Vine is jealous and selfish. The richest border has no more good than the Vine can in time appropriate to itself, and upper crops impoverish the soil, drive the roots of the Vine deeper after nourishment, and deprives them of the warmth of the sun.

#### PRUNING AND TRAINING.

Having conducted the culturist through the various operations of making the border, and placing his present or future plants (whether they be cuttings or pot plants) into the ground, we have now to look to the growth. If the cutting put forth any more than one shoot, the weakest must be rubbed off, and only one allowed to grow. The plant or cutting, as the case may be, must be regularly watered, and if it be a cutting, it should be shaded during the three hottest hours in the day, when the sun happens to be very bright, as it frequently will in the spring. The principal object the first year is to let the Vine make all the growth it can in the main stem, and to take away all side shoots, that they may not take the nourishment from the main branch. The object of pruning the Vine is to provide for the fact which we stated at the beginning, that the Vine is capable of producing a given quantity of wood and fruit in perfection, and that where it is allowed to provide for more than that quantity, it does not produce them in perfection that, in fact, it engenders that host of evils which many persons experience, but

which few know how to avoid. The difficulty is to know exactly how much it can do, that you may lose no great amount of crop, but we recommend you to err always on the safe side. In pruning, regard must be had to the place the Vine has to grow on. People do not often build walls for Vines, or we might tell them which would be the best way to build them. Vines are generally grown, because there is an opportunity offered by a vacant space on a house or wall, or other building. If you have to cover a wall that is only a few feet high, you cannot cover it too low; if, on the other hand, you have a building, of which the lower part is already covered with trees, you must let the stem of the Vine grow singly, until it has reached the height it ought to branch from, at all events, whether it be for the one or the other, the training close to the ground, or the training up high to reach the place it is intended to cover, the first summer treatment must be alike for the two different modes of pruning and training:—no lateral shoots must be allowed to remain on, except just the length of the first leaf, and the main shoot may go travelling onwards as high as it please. In September pinch off the top; in November cut it down to the two lowest eyes. The strongest of these, after growing two or three feet, the next year, or sooner, if it be ascertained is to grow, the weakest is to be cut clean out close to the main stem. Treat it the same the next season, taking off the fruit, if any appear, pinching off the tops of lateral shoots, just by the first leaf, and fastening the main shoot every few inches it grows, to save it from the wind, which might otherwise break it, and thus spoil a season. If the object is to keep a long stem, and not to train it near the ground, the entire growth must be allowed, but if the Vine is to be cut down again, the top should be pinched off in September. The third season of its growth it must be cut down to four eyes, two of each side; the



strongest of the branches on each side is to be left for training, the other to be cut out. The plan of leaving three in case one be lost, although generally practised, and by many recommended, is bad, because it may be, that the one damaged or lost be on one side, and the two strong ones on the other, and it is by no means

desirable to depend on bending one over to the opposite side.

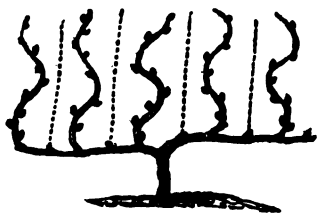
The following little sketch shows what we mean, the two strongest are the upper ones, the weaker are the lower, and are marked when they should come off. It is true, we have given foliage to the weak ones and left the strong ones without, but they are placed there rather to indicate, where the strong branches would be than to imitate them.



Having the next spring selected the strongest shoot on each side, they are to be trained horizontally, right and left, perfectly level, and somewhere about the length of four or five upper buds, the rest to be cut away. The under buds must be cut out completely. The next season the alternate shoots are to be allowed to grow, and the others must be pinched off, and the fruit of the former must be taken away directly it can be laid hold of, that the shoots may make all the growth the strength of the Vine will allow. Those which are pinched off may bear a bunch or two without doing mischief, as the Vine will be pretty well established. As the shoots grow, they must be nailed to the wall straight upwards, and not be checked until September, when the tops may be taken off, meantime thin out the grapes from the bunches that may appear, so as to leave ample room to swell, cut out all the small ones, and those which are inside. This can only be done by very pointed scissors, and the grapes must not be handled, except by the stems. It is not once thinning that will do. As soon as they are as large as small peas, the first thinning may take place, and great care should be taken to remove the smallest, if there be a difference, among those which are inside. When they have swelled a little more, so as to show better the grapes which are taking the lead, you should go over them again, still taking those which are least wanted, to make the bunch handsome, and which seem most likely to be stunted or hidden by the others. Mr. Hoare, whose treatise on the Vine on open walls has been strongly recommended by Mr. Loudon, recommends that no Vine be allowed to bear fruit until it is three inches in girth round the stem, and that then it should only be allowed to bear five pounds. Mr. Hoare assumes that he has proved this by experiments. We do not see the complete nature of the evidence at all; on the contrary, the same experiments tried elsewhere in different soils and situations, might give very different results, indeed, we have seen in a pot a vine not larger in the girth we should say than two inches and a half, with much nearer a dozen pound of fruit than any other quantity, and not without abundance of excellent wood. Mr. Hoare goes to an extreme.

However, we have already said no harm can come of this, because it is erring on the safe side. Mr. Hoare only allows half a pound of grapes for every good bud; would he for an instant lay down as a law, that handsome bunches are to be thinned back to that weight?

The pruning of Vines, and, consequently, their training, must be founded on principle. We set out by showing, that all fruit must be, or rather is, borne, by the present year's shoots, which come from last year's ripened wood—consequently, there are unerring rules to guide us in the selection of the shoots we are to leave, and those which may be cut away. Suppose we neglect the growth of this year's shoots which bear no fruit, we should find, when the autumn pruning time came, that we had no bearing wood to leave. To simplify, therefore, the process as much as possible, we might reduce the entire buds on a Vine to just the number that we want branches, and while we cut one half close down to form wood to bear next year, we could train the other half to bear fruit the present year. Then, the strongest shoots that come from those cut down must be encouraged to grow up for the following year, and if a bunch of grapes appear on either of these, it must be taken off, all the side shoots must be reduced to one leaf, and the whole strength be concentrated in the main stems or branches, which must in the mean time be fastened to the wall or house as it proceeds, in the same way as we have directed for the first and second year's growth. Suppose, therefore, the two arms which are trained outwards, will, at the end of the season, say September, present four or five vigorous shoots several feet long, and these should be stopped, that is, the upper part of them broken off, when the remainder of the season would be throwing strength into the remaining portions. Meanwhile, the shortened branches will have given a bunch or two of fruit, and any shoots which would have grown there will have been pinched off, or rather stopped short at a couple of joints beyond the bunch. When the leaves have fallen, or are close upon it, the long shoots must be trained. The best way to do this, according to Mr. Hoare's opinion, is the serpentine fashion, as exemplified in the cut, and they



ought not to be required to cover more than eight feet of wall or front in height, and twelve in width, they will therefore require to be shortened to reach that space only at the most, and the short branches where the grapes were

must be cut in to two eyes, or three at the most. The next year the long trained branches will bear the fruit at every eye, or nearly so, and the shortened branches will yield two or three shoots, the strongest of which is to be allowed to grow for the wood of next year's fruit, and the weakest to be taken away altogether. It is better to have the shoot from the bottom than either of the other two above it, if it be as good, or as strong a shoot as the others, not to be judged, however, by the length or forwardness, but the actual thickness, which is a good indication; but, generally speaking, either would be strong enough, and the reason for leaving three is, the chance of one being hurt or damaged by accident more than from any fear of its strength. These shoots, of course, come alternately, and if there be two come from one eye, the weakest is to be removed directly. One good shoot from each place, then, is to be allowed to grow as the others were the year before, the lateral or side shoots being pinched off beyond their first leaf, and the main one being fastened as it grows by pieces of shred nailed to the wall.

The fruit-bearing branches will shoot at each eye, and if so may show two or three bunches of fruit. The shoots must be so secured as not to damage the fruit, which should be reduced to the handsomest bunch, which is generally the one nearest the stem, but if most of the eyes bear no fruit, which is very rarely the case, then a second bunch may be left on those which have any. The shoots on which the grapes are should be pinched off at the second leaf beyond the fruit, and the portion of branch beyond the bunch enables you to nail it to the wall in the most eligible position, which is generally right and left of the main stem. There are many who strip the leaves of the Vine, to, what they call, give the grapes the benefit of the sun; now the Vine must not be robbed of its leaves, except where two leaves cover each other, and make too deep a shade. The leaves are as important to the fruit as the sun is, and nothing can be much worse than the ordinary practice of stripping them off wantonly. The thinning of the fruit three or four times, the repeated examination of the Vines, to remove any shoots that come out from the different parts which may often be found in a strong Vine where the principal shoots are stopped, and the occasional shifting of the fruit branches from the spot at which they are nailed to others a little higher or lower, according as the growth of the fruit or the branches in their immediate neighbourhood dictate. While the grapes are swelling, there will still be found, after several thinnings, here and there berries, which are better cut out than left in, and therefore every time the Vine is examined you should have the knife and scissors with you, and watch constantly till the fruit is fit to cut. The September stopping of the alternate branches, which are growing for the next year's bearing,

must be attended to, and when the fruit is ripening, bottles of sugar and water should be hung up in the neighbourhood of the grapes before the wasps attack them or break a skin, for it is but little use attempting to lure them from the fruit after they have once tasted or broken into them. The grape will hang on the Vine for a considerable period without being injured by a slight frost, but if there be any desire to bag them, as the easiest means of preserving them, the bags should be made of canvass as light and open and thin as possible.

Miller says, "during the summer season you should be very careful to rub off all dangling branches, and train up the shoots regularly to the wall as before, which will greatly accelerate the growth of the fruit, and also admit the sun and air to them, which is absolutely necessary to ripen and give the fruit a rich flavour; but you must never divest the branches of their leaves, as is the practice of some persons; for although the admitting of the sun must be necessary to ripen them, yet if they are too much exposed thereto, their skins will be tough, and it will retard their ripening; besides, the leaves being absolutely necessary to nourish the fruit, by taking them off, the fruit is starved, and seldom comes to any size, as I have several times observed; therefore a great regard should be had to the summer management of the Vines, where persons are desirous to have their fruit excellent, and duly ripened."

After such an authority, we have been surprised to see so many Vines nearly stripped of their foliage.

This plan of training and pruning, and indeed as a general management, we think the best, under all circumstances, where we have a clean wall, a clear border, new vines, and nothing to prevent our adopting it. And if we have to cover the front of a house, we should adopt the same principle, unless something intervened to make it in consonant. For the exemplification of the system applied to a house, the cut at the head of this article is sufficient. It will be there seen that separate Vines are used for the bottom of the house and for the top part, but excepting the length of the stem, before we divide the branches, the treatment is the same; all the attention that is required while the stem is growing to the height is to stop the side shoots, and at the pruning, to cut out or cut clean to the stump every one of them so that the trunk or main stem shall have no growth of any kind, until the two side branches are trained right, and left in the same way as that at the bottom—that is to say, we begin by providing only the four buds at the length we intend to commence training; the strongest on each side is used just the same as the bottom ones were used, to train horizontally, and provide the buds on the upper side for the alternate bearing and non-bearing branches, and to have the under buds cut clean

away, to prevent the growing of any wood but that which is wanted. The dotted lines in the cut show where the new wood will be ultimately trained (although it is for the summer growth merely made fast, as it goes where it pleases), and the branches as represented are the bearing wood of the present year. When the new wood comes under the window the branch must be taken round the outside of the window, otherwise there would only be room for a short branch, but by bending it to go round the window it may be grown as long as the best of them.

But there are other ways of training, which we have seen in some situations succeed pretty nearly as well; namely, the same treatment for pruning and the training merely being on a slope instead of serpentine; this is particularly applicable to the gable end of a house or where a wall slopes over a roof. The effect of a slope of forty-five degrees (which is the direction of a line drawn from the right hand bottom corner of a square, to the left hand top corner,) is as effective generally in the regulation of the sap as any other form in which it can be placed; the only thing against it in plain walls and fronts is the loss of room which there must be at each end, as a corner would be uncovered altogether. In short, so long as the pruning is bound upon the principle of keeping half the Vine growing bearing wood, and the other half bearing grapes, it is different to fail in producing plenty of fruit, and if these be reduced to a moderate quantity, they are sure to be of the finest flavour, and, above all things, they are certain of being hastened in their ripening. Some there are who let the Vine grow straight up instead of serpentine, but the effect of this is to run the crops heavy at the tops, and light, if there be any at all, at bottom.

But there is another way of training the grape Vine, which many prefer to the constant changes of the wood. The serpentine rods of a year old are allowed to throw out their side shoots, and to become themselves permanent fixtures. In this case, the side shoots intended for bearing next year are not stopped till September, and those that are too near are cut down to two or three eyes at the most. When they have done bearing, they are cut down to a single eye to grow wood from the next year, and the branches which are to bear are cut back to two or three eyes. In training these bearing branches, regard must be had to their being kept out of each other's way, and although three eyes may give a bunch or two each, not more than one ought to be left to the entire branch, if it be a good one, until the Vine by its age and strength warrants a second. At the places where the branches that bore last year were, the new branch to bear next year will come, and if more than one comes pluck away the weakest. This is called the spur system, only that persons who

do this are apt to leave three or four bunches where they ought to leave but one, and have the spurs themselves too numerous.

Notwithstanding we have directed the summer shoots which are to form the next year's bearing wood, to be allowed to grow as they will — straight up if they seem inclined, and calculated on the winter training for placing them in their serpentine position, there may arise a cause for placing them in their serpentine form as they grow. With a border made up as we propose, there may be an immensely vigorous growth, which will bring long joints and distant buds, which buds may not be fruit buds, when this is the case, that is to say, when the Vine is inclined to go to wood instead of fruit, which may be seen at once by the great strength of the shoots, let them at once be nailed to the right or left; and as soon as they have pushed enough let the next nailing be the opposite way, and so continue to the period for stopping them at the upper end; the stronger they are, the more close and sudden may be the bends, but still, let not this great strength tempt you to overload the Vine with the quantity of fruit you leave to ripen. The first few years one good bunch on a shoot of the present year's growth, or two small ones at the most should be permitted to remain, and these must be liberally thinned, for on this depends much.

#### TREATMENT OF THE BORDERS.

We have already said there should be no plants allowed to grow on the borders; the reasons are, first, because the roots of the Vine receive as much benefit from the heat of the sun and the operation of the air as from the richness of the ground; the second is, that in a border constructed as we have directed, the roots will almost fill it in time, and at all events come near the top. Now, cropping the borders will keep off the sun, and the necessary digging will damage the roots, both of which evils would be felt in many ways, and must be always avoided by keeping the border clear of every kind of vegetation; of course it follows that the surface must be kept free from weeds. Occasionally the border must be forked two or three inches deep, so as to open the surface, particularly when it has been closed by heavy rains; for this gives the roots, in a larger degree than if it were left close, the advantage of air and warmth. It may be proper also to mulch occasionally with stable litter, and also to water with liquid manure, indeed this may be always done with advantage in warm weather, and should be done equally all over the borders, even much beyond where the roots reach, because by keeping it all over alike moist, the Vine reaps all the advantage, whereas, if the portion beyond the extreme fibres be left dry, that part will absorb the moisture almost immediately from the part where it is of the most consequence, therefore the whole

extent of the border or place prepared for the roots should be moistened on all occasions alike.

#### ASPECT.

We have said little about aspect for the best reason; where one Vine has a wall built for it, a hundred are planted because there is a place for it to grow on. For instance, in the cut which illustrates the slanting mode of training, the house was not built for the Vine, but inasmuch



as the Vine cannot have too much sun nor too little wind, the warmest part of the house was chosen, and this is all we shall say of aspect. Choose precisely that portion of the wall which has the sun longest upon the ground at the foot of it, for it is quite possible to have a wall well adapted for it, that is, ranging east and west, so that from sun rise to sun set, it is hardly without it, and yet the border may be so shaded by other buildings as to keep it always cold. We do not say Grapes would not grow there and ripen there, but there would be no comparison between the produce and that of a Vine in the border which had the sun as well as the wall.

#### OF ESPALIER TRAINING.

As we shall show presently that green grapes may be made into wine equal to a good deal of that which is imported, we should not hesitate to train Vines on an espalier trellis, after the fashion of apple and pear trees, if we had no wall, but there would be seasons occasionally in which the grapes would not ripen, with all the care we could bestow. We should train them as we should on a wall, but not allow them more than five feet in height from the ground, and we should allow each Vine twelve feet. The frame or trellis should be made with stakes not more than two feet apart, and rails not more than nine inches, the lowest within six inches of the ground. The raising, planting, pruning, training, thinning, &c., must be the same in all respects, except that the shoots would not be so long. The ripening would be assisted by a

basking of any sort, if it were only a reed fence, but a board fence, in panels of six or eight feet long, and moveable, may be advantageously used to any favourite Vine or variety, and being fastened at the back, would assist much.

#### A FEW HINTS FOR EACH MONTH.

Winter time up to March conform as near as you can to the directions for pruning and training, that is, if done, see it be done properly, and rectify what is wrong; and this especially applies to Vines which are now for the first time under your care. If the Vine be old and neglected, covering a large space with weak shoots, and in neither form nor fashion, cut away at least one-half the old wood, taking away those branches which have the most weak shoots on them, and cut from those remaining all the weakest shoots, leaving only the strongest, and those at least two feet apart, and not more than three eyes in length. See that all the branches and shoots are firmly nailed, without being confined, pick off the loose bark, and brush out the accumulated dirt from all parts of the wall or front to which it has been fixed.

**APRIL.**—The Vine will begin to grow, and many eyes will push their fruit, and a weak shoot by the side of it; pull off all the weak shoots, and only let the fruit branch grow, and attend to this during the month.

**MAY.**—As soon as the shoots are twelve inches long nail them carefully to the wall, but remember that as the shoots will swell, they must not be confined in the shroud; rub off every shoot all over the Vine that is not strong enough to make good bearing wood, and has not fruit on it. In nailing the shoots, so dispose them as to give each room, and cover the wall equally. Towards the end of the month, as soon as the lateral or side shoots of the bearing branches are from four to six inches long, the tops must be pinched off just beyond the first leaf, but none of these shoots must be pulled off altogether.

**JUNE.**—Continue to pull off all useless shoots, that is, the weakest where there are any nearer than eight or ten inches apart, all that are too weak, and all that grow away from the wall; firmly nail as they advance, all the shoots intended for the bearing wood; and if they are very strong, serpentine them; place the nails on that side of the shoot which will best hold it where you want it; when the tendrils are six inches long pinch them off to one inch only. If any of the laterals that have been shortened send forth other shoots; pinch them off directly, take off the ends of the bearing shoots one joint beyond the grapes you mean to leave on the branch, many have three bunches, and you must judge by the general crop, the strength and size of the bunches, whether you will leave one, two, or three. The figure at the end of this paper shows something of the appearances which

only one at each shoot will make, and unless it be smaller, or more ugly than the others, those nearest the vine should be left.

**JULY.**—Be careful not to touch the grapes while in bloom. Continue to firmly nail the shoots which are to bear next year, as they advance, and to shorten laterals, and the young growth which the shortened laterals will cause to push; when the fruit has set, you must consider whether there is more fruit than the Vine can properly mature, and you had better reduce it to half the quantity that could be perfected, than to leave half a dozen pound more; have no bunches nearer than a foot apart, and if you can do it, let every bunch on the vine have one thickness of leaf to cover it, but not two. If any of them are exposed, see if by unnailing that, or any neighbouring branch, you can shade it. As soon as the fruit is as large as peas, commence thinning them, and this must be done repeatedly.

**AUGUST.**—This is a critical month in the swelling of the fruit, and if there be not abundance of rain, you must give an abundance of water or liquid manure: in a well made border water will do, but it should be from a pond or tank where it has been exposed to the sun. Continue thinning the fruit by taking away the smallest, removing superfluous shoots, nailing the branches as they grow, syringing gently with a garden engine with a fine rose all over the surface of the leaves, the water to fall on them, and not to be squirted upwards to take the under side of the foliage.

**SEPTEMBER.**—Thin the fruit for the last time, if there be any berries smaller than the rest, or crowded: pinch off the ends of all the summer shoots; put a wedge behind the shoots at each bunch, and loosen it by nailing it with a longer shred, and then removing the tight one, to allow it to hang from the wall, the wedge keeping it, nevertheless, firm. Cut out from time to time decayed berries. Use the ordinary precautions to prevent the attacks of vermin.

**OCTOBER.**—Keep the borders clear from falling leaves, and cut out damaged berries. The forwardest bunches should be cut first, but there is no hurry for the general vintage. Prune off useless branches, and when the fruit of a branch is taken away, the branch may be cut back also.

**NOVEMBER.**—The principal object is to gather the fruit as it is required, and to keep it from birds. A net for the whole, or a bag, or glasses for each bunch is necessary, and the Autumn pruning may be done at leisure, but the sooner the better.

We have thus completed a sort of Calendar of operations, more fully explained in the general directions, and common attention alone will enable any one to make the best of the Vine under whatever circumstances he may be placed. Not one in fifty may be able in all things



to conform exactly to every thing, but every step he makes towards it will reward him for the trouble, even if he be only lessening the quantity of wood and fruit on an old Vine, and conforming to the directions within his reach.



#### WINE FROM GREEN GRAPES.

ALTHOUGH the fruit may not ripen, a sure alternative presents itself; for white wine of the first quality can be made from that which otherwise employed, would be utterly worthless. Twenty-four pounds of grapes crushed on the stalks, with a due proportion of soft river water, one ounce of powdered argol, and a quantity of loaf sugar, sufficient to bring four gallons and a half to the specific gravity of 1.115 well prepared; four gallons, imperial measure, of white wine, which in two years (that is, kept one year and a quarter in the wood, and three quarters in bottle) may surpass any Moselle, and perhaps rival Sauterne or Bucellas. These are merely general hints, for we do not desire to reiterate, but our particular process is at the service of readers who may desire to possess themselves of it; in the mean time, one chief object of this communication is to advise persons who have availed themselves of Dr. McCulloch's directions, or those of other practical teachers, that after a first racking off from the gross lees about Christmas, and the second about the following grape season, when a renewed fretting becomes apparent, an ounce or two of coarsely powdered sugary marble put into the cask prior to returning the clear wine into it, and a bottle of the finest Bucellas added to supply the waste of the racking will be found of essential benefit to the wine. Most people use ardent spirits for filling up; the practice is erroneous; it vitiates the liquor, is productive of no one good quality, and is expensive. Bucellas is not costly, it assimilates perfectly with the wine of green grapes, adds quality but not fire, and fulfils the condition insisted upon by the best writers upon British wines, that of "always filling up with wine of a finer quality if possible."

It is in vain to attempt an imitation of Madeira or Sherry without employing flavouring drugs; but Bucellas being the product of a German Vine transferred to the west of Eu-

rope, assimilates and yields no factitious flavour.

We close here with the advice to use every cluster which will not ripen, and let us add to our stock of vines, under the assurance that, if we fail to ripen our fruit, we shall succeed in our vintage.

#### THE ROYAL BOTANICAL SOCIETY OF LONDON.

THIS now popular Society has issued its schedule of prizes for the exhibitions of 1844, and has wisely made separate lists of prizes for the different months. One good effect arising from this is the prevention of those attempts—those miserable attempts—to scrape together a sufficient number of shabby things out of season to claim prizes, when the productions were good for nothing; for instance, the days are the 30th of April, 4th of June, and the 2nd of July. Now, supposing prizes had been offered as they are offered by the Horticultural Society for certain things, without any reference to the months, we should have found, probably, as we have repeatedly found at other societies, the proper number of Geraniums, Roses, Calceolarias, Verbenas, Pinks, and some other productions, drawn up, by forcing for the first show, whereas none are here invited. Then, again, we should have had the ragged plants of Azalia Indica, Rhododendron, &c., with a few solitary blooms, out of colour, and all but falling, exhibited in July. It is of the highest importance to let the public well understand what they are to trust to, and here we have the necessary information. The prizes are given during the one or two months, as the case may be, while the productions can be shown in fine order, and they are excluded from the show, or rather from prizes only, while they cannot be exhibited as they ought to be. Many a misunderstanding has originated in the production of subjects, creditable for the time of year, but still very unfit for a public exhibition as specimens, in the hope of getting the promised prize for the best, and the refusal of the prize on the ground of their being unworthy. The fact being neither more nor less than this—the Society promised a prize for the best something or other, without reference to which meeting it is to be shown at, and without any intimation that there is any restriction. Somebody who thinks it more credible to show it out of season than in season, competes for the prize, and being according to the schedule fairly entitled to it, he feels annoyed at its being withheld. On this account we are glad that the Royal Botanical Society has had an eye to so important a point, and provided against a prolific source of mischief. On another subject we have to congratulate the exhibitors—the following provision for seedlings. All we hope and trust is, that their good intentions may not be frustrated by inju-

icious censors. The portion of the schedule devoted to seedlings is as follows:—

CLASS III.—SEEDLINGS.		To be awarded.					
		Apr. 30	Jun. 4	Jul. 2	£	s.	£
Letters.		£	s.	£	s.	£	s.
CC	Greenhouse Azalias	2	0	2	0		
		1	0	1	0		
DD	Pelargoniums	..	1	10	1	10	
				1	0	1	0
				0	10	0	10
EE	Pelargoniums, containing the deeper shade of scarlet	..	1	0	1	0	
	N.B.—This letter is intended to encourage the production of varieties combining the bright colour of those usually known as "Scarlet Pelargoniums," with the habit, foliage, and size of flower of the other "fancy" varieties.						
	It is the intention of the Society in future seasons to award prizes to those seedling Pelargoniums only which have been bloomed during the season previous, and are exhibited in No. 24 sized pots, so as to show the habit of the variety under superior cultivation.						
FF	Scarlet Pelargoniums	..	0	10	0	10	
GG	Calceolarias	..	1	0	1	0	
HH	Heaths	..	1	10	1	10	
			1	0	1	0	
II	Fuchsias	..	..	1	0		
JJ	Roses	..	..	1	0		
KK	Verbenas	..	..	1	0		

NOTE.—Certificates will be given to such seedlings of merit as have not prizes awarded to them. To be eligible for competition, all the subjects, except those included in JJ and KK must be exhibited growing in pots, and they must all be distinctly marked with the names they are to bear. No seedlings can have prizes awarded to them unless these conditions are complied with.

The first thing that strikes us as disparaging, is the limited number of prizes to some of the flowers, but as there is a general authority to the judges to increase them, this objection falls to the ground instantly. The prizes for the Geranium with the deepest scarlet, and the manner in which the object of that prize is explained, are highly satisfactory, because there can be no mistake. The plants shown for it must have the habit of the fancy varieties, and that which is the deepest scarlet is to have it. Form has nothing to do with this, because the object is to introduce colour, which, however ill formed the flower may be, will be a grand object attained, for we have at present nothing approaching a scarlet in the plants, of what we may call modern habit, for want of a better term. There is another distinct feature in the schedule for 1844 which will prove highly interesting and instructive. Class 4 is for the exhibition of plants in groups, of the natural order, a subject which

is but little understood, even by teachers themselves, for we have had conspicuous instances of individuals, standing high as teachers, being obliged to retract in one book what they have advanced in another. Now, the grouping of different plants of the same, or the reputed same, natural order, will be of great service in advancing knowledge on that particular subject—for instance:—

CLASS IV.—NATURAL ORDERS.		To be awarded.					
		Apr. 30	Jun. 4	Jul. 2	£	s.	£
Letters.		£	s.	£	s.	£	s.
LL	Camellias; collections of not fewer than 9 plants	5	0				
		3	0				
MM	Tropæums; collections of not fewer than 4 species or distinct varieties	2	0	2	0		
		1	0	1	0		
NN	Rutaceous plants, including Diosma, Crowea, Eriostema, Boronia, Correa, Zieria, and others; collections of not fewer than 10 species	2	0	2	0		
		1	0	1	0		
LEGUMINEACEOUS PLANTS.							
OO	Papilionaceæ; collections of not fewer than 12 greenhouse species	3	0				
		1	0				
PP	Mimoseæ; collections of not fewer than 6 species	1	0	1	0		
QQ	Myrtaceous plants, including Beaufortia, Calothamnus, Melalucea, Metrosideros, Eucalyptus, Myrtus, Eugenia, and others; collections of not fewer than 6 species	..	1	0			
			0	10			
CACTACEOUS PLANTS.							
RR	Collections of not fewer than 6 plants of the tall growing kinds, as Epiphyllum, Cereus, &c.	5	0	5	0		
		2	0	2	0		
SS	Single specimens of the tall growing kinds	1	0	1	0		
		0	10	0	10		
TT	Collections of not fewer than 30 species or distinct varieties of the dwarf-growing kinds, as Mammillaria, Echinocactus, &c.	..				3	0
						2	0
UU	Rubiaceous plants, including Gardenia, Rondoletia, Manetia, Bouvardia, Ixora, Pavetta, and others; collections of not fewer than 10 species	..	3	0	3	0	
			1	0	1	0	
VV	Composite plants, restricted to Helichrysum, Aphelaxis, Astelma, and Phænocoma; collections of not fewer than 6 species	..	..			1	0
						0	10
GESNERACEOUS PLANTS.							
WW	Collections of not fewer than 10 species, including Geaneria, Gloxinia, Sinningia, Niphaea, Achimenes, and others	..	..			..	

		£ s.	£ s.	£ s.		£ s.	£ s.	£ s.
<b>XX</b>	Achimenes; collections of not fewer than 4 species or varieties . . . . .	..	..	..	than 6 distinct exotic kinds . . . . .	7 0	7 0	7 0
						4 0	4 0	4 0
						2 0	2 0	2 0
<b>YY</b>	<b>ERICACEOUS PLANTS.</b> Cape Heaths; collections of 15 distinct kinds . . . . .	7 0	7 0	7 0	<b>MMM</b> Single specimens of new and rare kinds . . . . .	3 0	3 0	3 0
	N.B.—Persons exhibiting in YY cannot exhibit in ZZ also . . . . .	3 0	3 0	3 0		2 0	2 0	2 0
		2 0	2 0	2 0		1 0	1 0	1 0
<b>ZZ</b>	Cape Heaths; collections of 6 distinct kinds . . . . .	4 0	4 0	4 0	<b>NNN</b> Liliums; collections of not fewer than 3 species or distinct varieties . . . . .	..	2 0	2 0
	N.B.—Private growers and Nurserymen compete separately in YY and ZZ . . . . .	2 0	2 0	2 0	<b>OOO</b> British Ferns, cultivated in pots; collections of not fewer than 20 species . . . . .	..	2 0	2 0
		1 0	1 0	1 0		1 0	1 0	1 0
<b>AAA</b>	Greenhouse Azalias; collections of 12 plants . . . . .	10 0			<b>NOTE.</b> —The Exhibitions in this Class are intended to display the effect of natural classification, in representing the habits and affinities of natural orders or of genera. All the plants, with the exceptions of those in TT, III, JJJ, and OOO, are required to be in bloom.			
	N.B.—preference will be given to those collections which contain the greatest number of distinct kinds, where merit in other respects is equal.	5 0						
		2 0						
<b>BBB</b>	Greenhouse Azalias; collections of not fewer than 6 varieties. . . . .	5 0			There will be a double interest in this important part of the exhibition, and great opportunities will be given to the exhibitors to contrast their species, and thus give to the visitors the best practical lesson they can possibly receive. For our own part, there seems to be many absurdities in the natural system as at present arranged, and we strongly suspect many alterations will be made before the mass will be reconciled to it, but nothing could more effectually elucidate and explain the leading features than this plan of exhibiting them in their proper groups.			
	Private growers and Nurserymen compete separately in this letter, and those who compete in AAA cannot compete in BBB also.	3 0						
		1 0						
<b>CCC</b>	Greenhouse Azalias; single specimen plants . . . . .	1 0			Another important regulation has been made, requiring the plants to be labelled with their scientific names, and the places whence they were introduced. There is scarcely one point of more consequence than this. It saves asking a hundred questions, enhances the interest of the show, prevents the necessity of an exhibitor standing at his plants, gives every body an opportunity of making memoranda of what they have seen, and of enquiring at nurseries for any thing they require. There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
<b>DDD</b>	Rhododendrons in pots; collections of not fewer than 4 varieties . . . . .	3 0						
	N.B.—Private growers and Nurserymen compete separately in this letter.	1 0						
<b>EEE</b>	Rhododendrons in pots; single specimen plants . . . . .	1 0			There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
<b>FFF</b>	Epacrides; collections of not fewer than 6 species or distinct varieties . . . . .	2 0	2 0					
		1 0	1 0					
<b>GGG</b>	Clerodendrons; collections of not fewer than 4 species or distinct varieties . . . . .	..	2 0	2 0	There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
			1 0	1 0				
<b>HHH</b>	Statice; collections of not fewer than 6 species or distinct varieties . . . . .	..	1 0	1 0	There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
<b>III</b>	Proteaceous plants, including Protea, Grevillea, Banksia, Dryandra, and others; collections of not fewer than 10 species . . . . .	3 0	3 0					
		1 0	1 0					
<b>JJJ</b>	Coniferous plants, cultivated in pots, collections of not fewer than 12 species, well-grown plants . . . . .	..	..	5 0	There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
				3 0				
	<b>ORCHIDACEOUS PLANTS.</b>				There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			
<b>KKK</b>	Collections of not fewer than 15 distinct exotic kinds . . . . .	15 0	15 0	15 0				
		7 0	7 0	7 0				
		3 0	3 0	3 0				
	Collections of not fewer				There are some judicious regulations, which restrict large growers from sweeping away prizes in half a dozen different classes, and, upon the whole, it is very satisfactory to most of the leading exhibitors, who, after all is said and done, are the persons to conciliate. There is an announcement, also, that the judges will not be appointed from among the fellows of the Society; and we have heard that the exhibitors themselves are in some instances to choose their own, or at least to have a voice in the appointment; this, however, is not official, though a common subject of conversation. We may, therefore, look forward for three splendid exhibitions at the Regent's Park, and not more splendid as a whole than they will be interesting and instructive to every one who seeks to learn.			

## THE TASTE FOR FLOWERS.

STRANGE as it may appear to those who are not judges of flowers, they as often from natural taste, appreciate the most valuable, as inferior ones; and if a person who has a good conception of form, that is, whose eye would detect a bend in a line, the want of roundness in a ring, or discrepancies in a square, would if well instructed in the rules for estimating the properties, make as good judges as those who know the flowers by name, for they would judge without prejudice; which many who know all the flowers would not, on account of their having favorites to which they could not help leaning. It seems strange, that although nobody has attempted to dispute the properties of flowers as laid down by Mr. Glenny, the decisions at societies belie the very professions of the judges, and it is no uncommon thing to hear the man who has in a room when conversing, subscribed to the propriety of every sentence, go in as a censor, and act or let others act in direct opposition to the principles he had espoused, not an hour before hand, and is prepared to espouse again. This must arise from defective vision, bad memory, or strong prejudice. The first and second causes cannot be removed, and the last is a very unyielding disorder. If it were possible to find judges who did not know one flower by name, nor whether any one were old or new, cheap or dear, popular or neglected, and they would take our rules for their guide, they would decide more accurately than the most experienced dealer and cultivator in the country: they would be so perfectly unfettered by the consideration of any other value than that of quality, that the chances are they would in no one point err. But this should be a lesson to dealers, who, if they saw one stand of flowers with ten half guinea varieties, and another with none worth more than a shilling, are too apt to let value arising from scarcity, throw a great weight in the scale, instead of judging the specimens by their intrinsic properties. This is an evil which our floral contributor, Mr. Glenny, has been all along complaining of, and one which we should like to eradicate. It is a subject which we have invited him more than once to take up, but which he cannot touch, or, at least, so far as we are concerned, has not touched, without letting off such a tirade against poor unfortunate florists whose eyes are not so quick as his own, that we could never admit into our quiet pages, but we, nevertheless, see the importance of improvement in that one point, in so strong a light, that we wish there were frequent meetings some where to discuss the subject, and that the discussions were conducted with sufficient temperance to be reported here. It seems strange that the public at large are beginning to understand the thing so well, that many exhibitors prefer the man who knows nothing but what he can

read to many self-sufficient people who know a little, and show in *propria persona* the importance of the advice,—

“Drink deep, or taste not the ethereal spring  
A little learning is a dangerous thing.”

## DIRECTIONS FOR FORCING ROSES.

VERY few years ago forced roses were one of the luxuries of gardening, and the matter was looked upon as a difficult operation, in which accomplished gardeners only were successful; but with modern varieties the difficulty has vanished, and every one may have roses, at least in February, with the most simple means.

A pit 10 or 12 feet long and 8 feet wide, just high enough to stand upright in, with a door at one end, and a sunken path in the centre, a raised bed on each side of the path, and an 18-inch Arnott's stove at the further end, opposite to the door, with a pipe leading into a small brick chimney *outside* (a chimney is indispensable), will give great abundance of forced roses from February to the end of May. To ensure this, a supply must be kept ready; so that, say twenty, may be placed in the forcing-pit about the middle of December, a like number in the middle of January, and the same about the middle of February; they must not be pruned till taken into the house, when each shoot should be cut back to two or three buds or eyes, the latter for the strong shoots. The fire should be lighted at seven in the morning, and suffered to burn out about the same hour in the evening, unless in frosty weather, when it must be kept burning till late at night, so as to exclude the frost; and for this purpose double mats should be placed on the lights. The thermometer should not, by *fire heat*, be higher in the day than 70 deg. during December, January, and February; at night it may sink to 35 deg. without injury. The temporary rise in a sunny day is of no consequence, but *no air must be admitted at such times, or the plants will exhaust themselves, and immediately shed their leaves*. When the sun begins to have power, and in sunny weather towards the end of February, the plants may be syringed every morning about 10 o'clock with tepid water, and smoked with tobacco at night on the least appearance of the aphid or green-fly.

To ensure a fine and full crop of flowers, the plants should be established one year in pots; and plunged in tan or sawdust in an open exposed place, so that their shoots are well ripened: the pots must be often removed, or what is better, place the pots on slates to prevent their roots striking into the ground; but with the Hybrid and Damask Perpetual, even if only potted in November previous, a very good crop of flowers may

often be obtained, and a second crop better than the first; for the great advantage of forcing perpetual roses is, that after blooming in the greenhouse or drawing-room, their young shoots may be cut down to within two or three buds of their base, and the plants placed again in the forcing-house, and a second crop of flowers obtained. The same mode may be followed also with the Bourbon, China, and Tea-scented Roses; with the latter, indeed, a third crop may be often obtained.

Towards the end of March, when the second crop of flowers is coming on, the plants may be gradually inured to the air, by opening the sashes in mild weather. This will make them hardy and robust. Syringing should be practised every morning and evening; but when the flower buds are ready to open this must be confined to the stems of the plants and the pots, otherwise the flowers will be injured by the moisture; air must at first only be given about 12 in the day; care must be taken to remove the plants from the forcing-house to the greenhouse or drawing-room before their blossoms expand; they may then be kept in beauty many days. I have not found the check which the plants receive by this sudden change of temperature at all detrimental. During their second growth the plants should be watered once a week with manured water,\* and the surface of the pot occasionally stirred. Those that are forced with the greatest facility are worked roses; these seldom or never fail to give an abundant crop of flowers; stems from 6 inches to 1½ and 2 feet are equally eligible; the latter form elegant plants, and I think generally grow with greater luxuriance than dwarfs. China and Tea-scented Roses on their own roots are more delicate, and require more care; still one crop of flowers may always be depended upon, even from them. Instead of forcing them for a second crop, it will be better to place them in a greenhouse; they will then bloom again finely in May. I find, from experience, that all the autumnal roses may be forced every year without any disadvantage: to ensure their well doing, they must be removed from the forcing-house early in June, the surface of the pots dressed with rotten manure, and plunged in the same, or leaves, or any light substance. Towards the end of September they should be carefully shifted, removing nearly all the earth from their roots, into a compost of light loam and rotten dung, equal quantities (this is, on the whole, the very best compost for potted roses), watered and again plunged till required for forcing; this shifting would be better performed in June, but, as the weather is then often hot and dry, roses worked on the Dog Rose are apt to suffer.

\* Two pounds of guano to ten gallons of water forms the very best species of liquid manure; this should be stirred before it is used.

Pots of the sizes called near London 24's and 16's† are the best sizes for strong plants of roses for forcing; when potted, the large and unyielding roots should be cut off close, so that the plants may stand in the centre of the pots, the fibrous and small roots merely tipped.

The treatment recommended for roses in a pit with Arnott's stove may be pursued with roses in a house with smoke flues or hot-water pipes. Arnott's stove is recommended as an economical and eligible mode of heating, practised here to some extent with success for several years: on these stoves an iron pan, fitted to the top, should always be kept full of water. Roses may be forced slowly, but with perhaps greater certainty, by the uninitiated, by giving air freely and constantly in mild weather during the day, keeping the fire constantly burning during the same period as recommended when keeping them closely shut up.—*Rose Amateurs' Guide*.

#### NOTES ON PLANTS, PRACTICE, AND PERIODICALS.

**SUBSTITUTES FOR GLASS.**—The old method of growing cucumbers and melons under thin waterproof muslin or cloth, instead of glass, is talked of as a new thing, as some new manufacturer has introduced the subject. It will be remembered that we gave several papers on the subject in Volume I. It will, doubtless, answer the purpose for many things quite as well as glass, for, although light is indispensable to plants, they do not all require it in the same quantity. The plants that would thrive in a tropical forest, for instance, under the shade of trees, would not require, nor succeed well, with all the bright sun of a Midsummer day. Our grandfathers were not so ignorant as some of the young ones fancy after all!

**CLEARING OF WEEDS.**—We are refreshed, as if it were a new lesson, with the assurance that weeds are to be destroyed by constantly cutting them off as they come up, and with tales of people who have eradicated gout weed and ferns by constantly cutting or pinching them off as fast as they come up. There is certainly not perseverance enough on the part of those troubled with perennial weeds, or we should never see leading articles devoted to lessons for their removal, that may be found in the oldest gardening books.

The late Mr. KNIGHT'S PAPERS are subjected to the remarks of Mr. Wood, of "one-shift system" notoriety, and Mr. Knight, who is held up as one of the most enlightened and persevering of modern horticulturists, distinctly says, when speaking of pine-apples:—"To ob-

† The respective sizes of these pots are 24's, 7½ inches deep, and 8 inches over, measuring across the top of the pot; 16's 8½ inches deep, 9 inches in diameter.

tain fruit of a much larger size, it will be found necessary to restrain the plants from bearing fruit to a greater age than mine have ever been permitted to acquire, and in such cases it will be found beneficial to REMOVE THE PLANTS ANNUALLY INTO LARGER pots, &c." Mr. Wood only gets over this by being "strongly inclined to think Mr. Knight was mistaken."

**FIGS**, we are told, rarely attain maturity in the open air. This is for want of attention, we have seen them at Goodwood, not only in the open air, but in the open ground, away from a wall, and the fruit dropping off with mature growth and ripeness. The only pruning the fig requires, is to take away the weakest branches or shoots, to throw strength into the better ones, for the fruit is borne all along the shoot.

**CHEMICAL COMPOSITION OF THE ATMOSPHERE**.—The only theories built up respecting this subject seems to have had a check by the book just published, called Rigg's Elementary Researches. We see nothing on this head to communicate, except through Mr. Rigg's book, which we shall notice.

**BEES**, a very economical mode of keeping bees is suggested. A board is put on a common butter tub, and cemented to it, two holes are made in the board, and the hive of bees are placed on the board. T. W. Jeston, Esq., of Henley, states, that with this contrivance he found twenty-six pounds of honey in the tub, besides what was in the hive for his bees to live on, so he took the honey from the tub for his use, and replaced it to be filled again. The fact is published in the Transactions of the Royal Agricultural Society.

**FUCHSIAS** are said to be best set to work at this time of the year to produce large specimens, because they grow rapidly in the spring months, when they are not disposed to bloom, but when the sun is hot, and elaborates the juices, they are inclined to bloom, and not to grow. It is, however, rather astonishing to find an advocate of the one-shift system recommending that young plants well rooted should be shifted to twenty-four sized, and then again to eight, four, or two-sized pots. We quite agree with the author as to shifts, but we would have more of them. The writer is one of the regular contributors to the *Chronicle*, which has been lauding another Fuchsia "*Exoniensis*," and this writer (whose place at Brooklands is a great credit to his taste) says, "*Fuchsia Exoniensis*, as exhibited on the plant at Chiswick this season, is in my estimation objectionable, *because the habit is bad*." He admits it is good off the plant. This is like saying a man has an ugly head of hair, but that it is good when cut off. Of course, the flower of a Fuchsia off the plant is worthless, so, if it be objectionable on, it is objectionable altogether.

**ALLOTMENTS OF LAND**, according to the Highland Society's Journal, should, as a mini-

mum, be ten acres to keep each family. A very sensible man proves that he has kept a wife and four children comfortably with five acres, with the help of little boys, whom he teaches reading, writing, accounts, collects, and catechism, three hours of a morning, for three hours of their labour in the afternoon; and forty pounds is the sum required as an outfit for such a farm.

**PROLIFIC WHEAT**.—The wheat which has been raised from the grain found in mummies is said to be highly prolific, even in the proportion of thirteen to one of common wheat. On this account it is naturally alledged to be of some agricultural importance.

**LUCULIA GRATISSIMA**.—This beautiful shrub is strongly recommended by a correspondent (of a newspaper) who affects to regret its scarcity. We can inform the writer that it is neither scarce nor dear. It was a stock plant with Mr. Bell, of Norwich, before the ruinous hail storm destroyed his glass, and we think it must be a miserable collection that has it not. The plant is a very free striker and grower, and the health and strength of Mr. Bell's stock, which was in a vinery, not forced much, leads us to say a warm greenhouse suits the habit of the plant. It has a beautiful perfume, and the bunches of lilac flowers are showy.

**ROOT PRUNING FRUIT TREES**.—We are told of fruit trees which had been planted on pavement to keep their roots from gravel, and in the course of years extended their roots beyond the pavement, where they entered the bad soil, and spoiled the produce. That they were not pruned to within the space of the pavement, and the fruit comes fine again. The authority is Major C., but who Major C. is, the newspaper does not tell us. However, that root pruning does wonders we have ourselves observed at Mr. Rivers' at Sawbridgeworth, where pear trees were bearing the season they were removed, and in great abundance.

**SPADE CULTURE**.—We have already shown at some length, on the authority of Mr. O'Conner, the efficacy of spade culture. A correspondent of a weekly paper says, that by digging twelve inches, instead of ploughing five or six, he has produced forty bushels of wheat to the acre, and the difference between the spade and the plough was twenty shillings per acre. We wish there were more spade culture.

**GARDEN ASSOCIATIONS**.—We have been a consistent, an earnest, and practical supporter of gardeners' societies, for some time alone, but we are always glad to see others follow our example. A correspondent of the *Chronicle* recommends them. We would have the whole body of British gardeners in communication with each other.

**ONE-SHIFT SYSTEM**.—A journal which has been supporting this has a letter from a correspondent, who speculates on certain theories which "account for the failures which have at-

tended this system of potting during this season." We were quite prepared for failures, and have heard that some of the warmest advocates have been changing back to moderate sized pots, not, however, without first being warned by the death of some that the others were in danger.

**THE PINE APPLE.**—The cultivators of this fruit for the market never try for large fruit, but for a rapid production; hence, many of them obtain from suckers fruit in fifteen or eighteen months. Those who want large fruit grow their pine plants much longer before they start them into fruit, and on the period of time which the plants are making age and growth, without starting the fruit, depends, under proper management, the size of it when it comes. A controversy has arisen, in which the market gardeners are reproached as being unable to grow large fruit, and two gentlemen's gardeners, whose object it is to bring large fruit, and who go to work on an opposite system to those who are for rapidity of production, were lauded as wonders. We mention the subject only to show how absurd it is for any one but a grower to give strong opinions as to what men can do, instead of enquiring what men wish to do.

#### THE LINNEAN BOTANIC GARDEN AND NURSERIES AT FLUSHING.

THESE grounds, which under the able management and care of the Prince family for upwards of a century, have risen to their present importance, are situate in the immediate vicinity of the steamboat landing, at the romantic little village of Flushing, within a two hours' ride or trip from New York. The spot was wisely chosen by Mr. P.'s ancestors, both for convenience and beauty; the occasional glimpse which one catches of the Sound, the distant rocky banks of the Hudson, and the intervening country, tends not a little to enhance the pleasure of a walk through these gardens. Our readers will have some idea of the extent of these nurseries, when we tell them that they at present comprise upwards of thirty acres, and that this year alone Mr. Prince has inoculated about 70,000 buds of the various descriptions of fruit trees. Amongst the many varieties of stocks used for inoculation we were shown one which we believe to be peculiar to this nursery, we allude to a new specimen of the native cherry, valuable for its extreme hardihood as also for the vigour of its growth, standing by rows of other varieties of the same age, the latter property is very apparent.

Of the immense number of varieties of apples and pears we have neither time nor room to speak at length; it must suffice that we remark their general appearance as being remarkably vigorous and free from every appearance

of disease. Those who may wish for a minute description of the many varieties, as well as the other products of these nurseries, we would refer to the descriptive catalogue just published by the proprietor; a work which, by its admirable arrangement, at one glance presents to the eye the form, color, size, use and quality of the fruits, as also the season when they are at maturity; this catalogue, comprising as it does, the description of many hundred varieties, will furnish the most valuable assistance to those about to lay out orchards, in which they wish to possess a succession of fruits.

The peaches and plums, squares after squares of them we passed, all having the same healthy, and uniform appearance. With regard to the inoculation of the peach on the plum stock, Mr. Prince informed us that after repeated trials he had come to the conclusion that the *plum stock is not propitious to the growth of the peach bud*. Of the rapidity of growth of the plum, we were shown striking instances, as much as 9 and 10 feet in one year from the inoculation. Of quinces we would make one remark—of late years many complaints have reached us of the scarcity of this tree; we are however, now enabled to inform those of our readers who may be in want of a supply, that Mr. Prince has 7,500 trees fit for immediate transplanting. The varieties of grapes to be found in this nursery number upwards of 70, chiefly American. Mr. P., in alluding to the sensation that was created amongst Horticulturists not long ago, upon the introduction of two new supposed varieties, called *Longworth's Ohio* and the *Madeira Grape*, assured us that both specimens had long existed in his garden under the names of *Norton's Virginia* and *Herbmont's Georgian*. We noticed a specimen of the vine, *Scuppernong*, whose delicate foliage struck us as being exceedingly beautiful the leaves greatly resembling a species of the *Cissus*.

The horse chesnuts, of which Mr. P. has now ready for transplanting 6,000 trees: the many varieties of the fir; the Balm of Gilead; the weeping Birch of Scotland, the first specimen of which was imported into this country by Mr. Prince's father 30 years ago, and which is now to be seen in the nursery; the dwarf chesnut, a Hybrid between the *Spanish* and the *American Chinquapin*; the Spanish chesnut, or *Maron*, whose fruit furnishes food to many of the lower orders in the south of France and Italy; the graceful mountain ash; the shade affording Ailanthus; the European Linden or lime-tree; the ornamented silver-leaved maple, and that giant of the west, the Buck-eye of Ohio, are all to be seen here flourishing in the greatest perfection and variety. To see the splendid specimens of the Magnolia would alone amply repay a trip to Flushing. Some of these trees measure 20 and 30 feet in height. Did our space allow, we

would wish more minutely to describe the sample grounds in which Mr. Prince has planted one specimen of every description of fruit in his Nurseries—we must endeavour to allude to this and other topics connected with the gardens on some future occasion. The Paper Mulberry, both red and white, may be seen there in great perfection, now in bloom and fruit.

The mention of the Mulberry plant, reminds us naturally of silk. Mr. Prince informs us that he has been very successful in obtaining silk from the *Multicaulus*, and it is his intention to have specimens of the produce, both raw and manufactured at the approaching fair of the American Institute.

In concluding our remarks for the present, on the subject of Horticulture and nurseries, we cannot refrain from expressing our admiration at the general state of the nursery to which we have more particularly alluded. Order, system, and cleanliness appear to prevail throughout. Both the Horticultural and Floricultural departments are well worthy a visit, from the pleasure seeker and the botanist. Indeed, we do not know how either could spend a day more pleasantly or profitably than in visiting the Linnæan Botanic gardens of Mr. Prince.—*Spirit of American Institutes.*

#### EXPERIMENTS ON LAND.

BY J. WHITTEN:

I BEG leave to lay before the Society the results of some experiments which I tried this year in a cold, wet, and hilly part of this country, on a field of turnips, and from one of them I am convinced that all landed proprietors who deter their tenants from practising it, act very much against the interest of those, and, as a matter of course, against their own also—I mean scorching, or, as it is often called, charring, and between which and burning into ashes there is a material difference; for in the former there is nothing scorched but the roots and seeds of weeds, which with all the tough clods are collected together by raking, and well heated until all pernicious matter is destroyed in them; insects are also killed, the land warmed, and all rubbish of the kind converted into a light manure, which is both cheap, and what is equally good, within the reach of every poor man.

In the same field I used different kinds of manure, and I found what was merely scorched as productive as even that sown with Guano, which I had carefully mixed with bog mould, at the rate of four cwt. of the former to eighteen cart loads of the latter, to the Irish acre, and had it carefully mixed for about five weeks previous to putting it out, having been delayed that length of time in consequence of the weather being too wet to set the bullocks to work the land; and I consider the delay only served to mix the Guano better with the mould. The

turnips grown on it were a good crop, when the quality of the land is taken into consideration, it being wet, cold, poor, and previously ill-managed. It gave, by calculation, forty tons to the acre—a drill of twenty-four feet long by thirty inches asunder, the turnips being a foot apart, and averaging three and a half pounds each. All kinds of them grew well on the Guano, but the old Swedes and Skirving's improved, (a few of which I sowed for experiment) grew under-size, though of good quality, and will keep; but the other kinds being of a softer nature are made very much so on it, and I don't think they will keep as well as when grown on any other manure.

The part of the field on which I sowed the Swedes and Skirving's improved on farm-yard dung, proved a crop of forty-six tons, each turnip being on an average four pounds, the length of drills and distances being the same through the entire field. Being short of manure, I got bog mould put into the dung pit, in which there remained the liquid after the dung was removed. I left the mould in this for three or four days, and put it out at the rate of one hundred cart loads to the acre, and on this there were forty-three tons to the acre, the turnips averaging three and a half pounds thirteen ounces each.

On the part which I scorched there is a crop of fifty tons, each turnip averaging four pounds twelve ounces, and they are still growing, and none of them show the least tendency to rot or softness, which those grown on the Guano do very much, and besides the difference in quantity and quality, this method of manuring such land is of course the cheapest; and very few poor farmers can afford to pay even at the low rate of £3 to the acre for Guano, while, if allowed to treat his farm in this simple manner, he will be induced to plant this valuable crop, which would serve him in various ways, as it will give nutritious food to his cattle, add to their weight and appearance, increase their milk and butter, and materially increase the manure. Yet they lose all those benefits in consequence of not being able, as they imagine, to procure manure sufficient for the growth of turnips; while the landlord, from a very mistaken idea, prevents the tenant from scorching an almost useless piece of land, though by doing so he would derive so much benefit and profit.—*Transactions of the Gardeners' and Stewards' Mutual Instruction Society, Dublin.*

#### WINTERING THE HEARTSEASE.

TO PANSY GROWERS.—I have adopted a plan of preserving my plants which are turned out, for two years past, which answers admirably well, and is well worth knowing to those who have beds of Heartsease to stand the winter.

My plan is to sift some mould from under-



neath the potting bench, that being of a light sandy nature, and the rain passes through it readily, and which I might term earth up my plants which are intended to stand the winter, by placing the mould close round them, and if there are several shoots in a bunch, I take care to shake it down between each, leaving only the top of each shoot exposed, and should any of the shoots be long, I peg them down, covering them over all along the ground, leaving the point only out.

Heartsease are perfectly hardy from frost, but the trying winds does mischief, and I find the above simple process a certain preventative, you might have seen it done, but I have never seen anything written on the subject, and hope you will excuse the liberty I am taking by naming it.

C. T.

#### RAMBLING NOTES—SUN-FLOWERS, PANSIES, GERANIUMS.

DURING the Autumn of the present year I had occasion to visit Germany. On my journey from Magdebourg to Leipsic I observed a continuous line of sun-flower planted on the extreme edges of the railroad, and which I really think must have extended forty miles, but I may safely name half that distance. The soil was poor and sandy, and the plants were often small and stunted in growth, still the greater proportion were healthy and vigorous. I neglected to ascertain whether these plants were cultivated for use, or ornament, but as poultry will feed on the seeds, or oil may be produced from them, I presume their production might be turned to some advantage.

I noticed a great variety of blooms, some were all yellow, others had a large dark centre, while others were so filled up with petals as to resemble a large chrysanthemum, others, again, had almost quilled petals. The shades of colour were various, varying from a pale straw to a full yellow.

Might not this plant be rendered both useful and ornamental if introduced on the vacant spaces of our numerous railroads? In your notices to correspondents on the 2nd instant, you refer to "a Captain Thurtell enlightening the world with second-hand novelties." As this notice seems to refer to me, please have the kindness to give me the title of the said almanac. Though I am quite willing to confess my total ignorance of botany, and do not profess to know much about floriculture, and find it somewhat difficult to make the result of my observations very intelligible, still I must confirm what I before stated relative to seedling geraniums. The past season I bloomed many pleasing varieties, and though I would not venture to pronounce one of them first-rate, several were quite equal to what I purchased at high rates,

and were quite good enough to reward an amateur for his trouble. My only object in stating my views was to induce others to try experiments, and like myself to attempt the improvement of some particular species of plant by which means a striking addition might occasionally be made.

I have raised this season a blue bordered variety of pansy that is very striking and very constant, but at the same time imperfect in form. The variety is too distinct to admit of throwing it away, and I am anxious to improve upon it. For this purpose I have made a bed of Pansies, planting first a blue border, and then a white, by which means I hope to succeed. Can you assist me by naming three, six, or a dozen good white varieties, with bold striking eyes. If you would like to try the same experiment I shall have much pleasure in sending you two or three plants next spring, or furnishing a number of cuttings so soon as the season of the year will admit of it.

I am, Sir,

AN AMATEUR.

Leeds.

[The publication alluded to was "Johnson's Gardeners' Almanack, in which it will be seen the Editor gives Captain Thurtell's notions as if they comprised something new, whereas our Leeds correspondent had a year before given much better lessons. With respect to the Heartsease, we should be apt to try them with better formed and thicker flowers than any white we have at present in general cultivation, say with Curion and Eclipse (though we are told that Thompson has a yellow ground flower that beats his Eclipse). Our best whites are crumpled. Sunflowers are cultivated for their seed, and the oil that is expressed from them, and will grow nearly everywhere. There is much nourishment for poultry of all kinds in the seed of the Sunflower, which is cultivated in large quantities in America. We shall feel obliged for a flower of the Pansy in a letter between two cards.]

#### THE FORMATION AND ALTERATION OF PLEASURE AND KITCHEN GARDEN.

In a series of papers on this important subject, we hope to be able to show a very moderate observer how he could best adapt a piece of ground to his wants and wishes and turn it to the best advantage; for it is certain, that one half the capacity may be easily destroyed by adopting a bad plan, and that by merely the difference of planning and planting, one piece of ground, might be made to appear twice as large as another of the same size. If one person be having all for show and nothing for use, the ground, if small, should be all pleasure ground, if on the contrary, the owner be anxious for all the produce he can get, and indifferent to ap-

pearance. The entire space should be made available for fruit and vegetables, and such flowers only that may be used for nosegays. In the former case we should no more think of a straight path than we should think in the latter of a crooked one, and in the former, notwithstanding the objection which has been made by some people to box edgings, we should use them, because they take up less room than any other, and grow into money every three years. Much depends on the locality, the nature of the ground, the country round it, and the general scenery in the neighbourhood as to how you should lay it out. If there be any object in retaining particular prospects, a sunk fence may be proper and low planting; if on the contrary, it be desirable to shut out disagreeable objects, then a high wall or high planting, or both may be necessary. It has been the object with many of our predecessors to tell us how we ought to choose a piece of ground for a garden, but in nineteen cases out of twenty we have no choice, we find a house with a garden attached, and such as it is we are obliged to put up with. But there is something to be done even then: according to the form of the ground, so the pleasure garden must be placed, and the shape of it be fashioned.

Though the fruit and kitchen garden are here mentioned as two distinct gardens, and have by the French gardeners, as also by some of our own countrymen been contrived as such, yet they are now usually in one; and with good reason, since they both want a good soil and exposure, and will equally want to be placed out of the view of the house. And as it will be proper to enclose the kitchen garden with walls, and to secure the gates, that no persons may have access to it, who have no business in it, for the sake of preserving the product, so these walls will answer the purposes of both. Moreover, in the disposition of the kitchen garden, when it is properly divided into quarters, the planting of espaliers of fruit-trees round each of the quarters, will be of use in screening from view the kitchen-herbs growing in the quarters; and, by that means, give an elegance to both parts, and save besides a great expense. The only objection which has been made to this, of any consequence is, that the gardeners are too apt to crowd the borders near the walls with kitchen-herbs, whereby the trees are deprived of their nourishment; but this is in every gentleman's power to redress, by not suffering the borders to be thus crowded.

In a garden for pleasure, the principal thing to be considered, are, 1st, the situation; 2dly, the soil, aspect, or exposure; 3dly, water; 4thly, prospect; and suppose we have the means of choosing, it may be desirable to choose.

1st. Situation: this ought to be such an one as is wholesome, in a place that is neither too high nor too low; for if a garden be too high,

it will be exposed to the winds, which are very prejudicial to trees; if it be too low, the dampness of the ground, the vermin, and venomous creatures that breed in ponds and marshy places, add much to their insalubrity.

A situation on a rising ground, or on the side of a hill, is most happy, especially if the ground be not too steep; if the slope be easy, and in a manner imperceptible; if a good deal of level may be had near the house; and if it abounds with springs of water; for, being sheltered from the fury of the winds, and the violent heat of the sun, a temperate air will be there enjoyed, and the water that descends from the top of the hills, either from springs or rain, will not only supply fountains, canals, and cascades, for ornament, but when it has performed its office, will water the adjacent valleys, and render them fertile and wholesome, if it be not suffered to stagnate in them.

Indeed, if the declivity of the hill be too steep, and if the water be too abundant, a garden on the side of it may often suffer, by having the trees torn up by the torrents and floods; and the earth above tumbling down, the walls may be demolished, and the walks spoiled.

It cannot however be denied, that the situation on a plain or flat, has several advantages that the higher situation has not: floods and rains make no spoil; there is a continued prospect of champaigns, intersected by rivers, ponds, brooks, meadows and hills, covered with buildings or woods; and the level surface is less tiresome to walk on, and less chargeable, than that on the side of a hill; the terrace-walks and steps are not necessary; but the greatest disadvantage of flat gardens is the want of an extensive prospect, which rising grounds afford.

Secondly, The next thing to be considered in choosing a plat for a garden, is a good earth or soil.

It is scarcely possible to make a fine garden in a bad soil; there are indeed ways to meliorate ground, but they are very expensive; and sometimes, when the expense has been bestowed of laying good earth two feet deep over the whole surface, which for a large garden is an expense too great for most persons; and after this a whole garden has been ruined, notwithstanding the exposure has been southerly and healthful, when the roots of the trees have come to reach the natural bottom.

To judge of the quality of the soil, observe whether there be any heath, thistles, or such like weeds, growing spontaneously in it, for they are certain signs that the ground is poor. Likewise if there be large trees growing thereabouts, observe whether they grow crooked, ill-shaped, of a faded green, and full of moss, or infested with vermin; if so, the place is to be rejected: but on the contrary, if it be covered with good grass fit for pasture, then you may be encouraged to try the depth of the soil.

To know this, dig holes in several places, six feet wide and four feet deep; if you find three feet of good earth it will do well, but less than two will not be sufficient.

The quality of good ground is neither to be stony, nor too hard to work; neither too dry, nor too moist; nor too sandy and light, nor too strong and clayey, which is the worst of all for gardens.

3dly. The third requisite is water. The want of this is one of the greatest inconveniencies that can attend a garden, and will bring a certain mortality upon whatever is planted in it, especially in the greater droughts that often happen in a hot and dry situation in summer; besides the usefulness of it in fine gardens, for making jets d'eau, canals, cascades, &c. which are the greatest ornaments of a garden.

4thly. The fourth thing required in a good situation is, the view and prospect of a fine country; and though this is not so absolutely necessary as water, yet it is one of the most agreeable beauties of a fine garden; besides, if a garden be planted in a low place that is buried, as I may, and has no kind of prospect, it will be not only disagreeable but unwholesome, by being too much shaded and obscured; as the trees will rather retain insalubrious damps, than communicate the refreshing air, that is so purifying to vegetable nature.

In short, a garden necessarily requires (besides the care of the gardener) the sun, a good soil, a full or at least an open prospect, and water, the last above all; and it would be egregious folly to plant a garden where any of these are wanting.

In a fine garden, the first thing that should present itself to the sight, should be an open lawn of grass, which, in size, should be proportionable to the garden; in a large garden it should not be less than six or eight acres; but in middling or small gardens, the width of it should be considerably more than the front of the house; and if the depth be one-half more than the width, it will have a better effect. The figure of this lawn need not be regular, and if on the sides there are trees planted irregularly, by way of open grove, some of which may be planted forwarder upon the lawn than the others, whereby the regularity of the lawn will be broken, it will render it more like nature, the beauties of which should always be studied in the laying out and planting of gardens; for the nearer these gardens approach to nature, the longer they will please; for what is a garden, but a natural spot of ground, dressed and properly ornamented?—there are those who have erred in copying of what they call nature, as much as those who have drawn a whole garden into straight lines, great alleys, stars, &c. by bringing the roughest and most deformed part of

nature into their composition of gardens; as for instance, where the ground has been naturally level, they have, at great expence, made hollows and raised mole-hills; so that the turf has been rendered not only more unpleasant to walk upon, but much worse to keep; and after all the pains that have been taken to ape nature, the whole is easy to be discovered the work of art, as the stiffest slopes and the most finished parterres.

The great art in laying out of gardens, is to adapt the several parts to the natural position of the ground, so as to have as little earth to remove as possible; for this is often one of the greatest expences in making of gardens, and it may with truth be affirmed, that wherever this has been practised, nine times in ten it has proved for the worse; so that if instead of levelling hills to form large terraces, stiff slopes, and even parterres, as have been too often practised; or the sinking of hollows, and raising of hills, as hath by others been done; if the surface of the ground had only been smoothed and well turfed, it would have had a much better effect, and been more generally approved than the greatest number of those gardens which have been made with an infinite expence both of time and money.

The next thing to be observed is, to contrive a dry walk, which should lead quite round the whole garden, with a communication to any other places that are attached to the premises and appertain to the garden, but there must not be too many communications with other places, and these should be as much as possible concealed, or made to glide off imperceptibly. Walks to go round a lawn should be at least six feet wide, not equally close all round, but somewhat in the form of those already engraved in a former part of the work; but we shall, in the course of these articles, give a number of diagrams to serve for plans and explain the work.

#### THE PANSY AND ITS PROPERTIES.

THE notion entertained by some of your readers that the Pansy does not progress as it ought, reminds me of a paper I had written upon that subject, and I enclose it.—G. GLENNY.

“The real obstacle to the improvement of this flower has been the vitiated taste which has encouraged size, as if that were the leading property; and Mr. Thompson, who was the precursor as it were in this race for size, began by encouraging a breed of notchy, irregular, serrated petals, and others have followed in the same track. Small, well-formed, smooth-edged flowers have been discarded,

only because they were small. It may have been difficult to persuade people to buy such, but it should have been from those only that the seed should have been saved to produce good flowers. Heartsease have gone back instead of progressing with many people. At the time *Reform*, a very neat little flower, and two or three of its compeers were in the ascendant, there was every promise of greatly improving the flower; but *Thompsonii*, a large lop-eared coarse variety, was put out by the raiser, and all the subsequent breed has been much after the same fashion. We recommend those who want to improve this beautiful tribe, to select none but smooth-edged varieties to begin with; let the order be distinct on this head, and from those select the best formed to seed from. From these seedlings, which will begin to bloom in ten weeks from the sowing, if at the right season, select none but smooth-edged and circular flowers for growth and propagation, and continue to save seed from such flowers only, it will generally be found that a slight advance will be made towards the desired properties. Had one-tenth of the efforts been made in a right, instead of a wrong, course, the *Pansey* would have been very different in its character to the present day; for it must be confessed that hundreds of weeds are turned out to assist in the confusion and degeneration of this favourite flower. We have seen, and, as times go, approved of several this year, because, in comparison with the mass, they have been good. If some of these varieties come out, we shall be told perhaps they are too small, but, as well as we remember, they have been something like varieties we already possess, but less in size, more circular in form, more velvety or thick in texture, and more flat; and we have rather recognised the indication of an advance the right way, however small, than notice more striking and gay flowers which possess nothing but size to recommend them. The figuring of Heartsease in some of the periodicals has greatly aided in the deception of the public, for, as if on purpose to catch the unwary, the flower has been grossly misrepresented, and the buyer who has relied on the picture, has been, to use a vulgarism, *done*. We shall be glad to aid and assist in pointing out the best blooms submitted to us, when growers will take the trouble to send blooms, but many persons who have done this, have sent them in such bad condition, that it has been almost impossible to recognise a single character; others have sent up flowers without name or number, so that we had no means of describing them, even when we found anything that was promising. We have paid great attention to both Heartsease

and Geraniums, and, indeed, all other subjects of which specimens have been sent, and the Post affords great facilities for cheap conveyance of blooms, for they weigh very little; care, however, should be taken that the packet should bear the Post-office usage, for they press their stamp on every thing very hard, and a number of chip-boxes have been literally smashed. We care nothing about who a flower belongs to; if it be good, we will do all we can for it, for it is our desire to make a very pointed distinction between a decidedly good thing and the trash too generally sent out. This, however, will do no good, while nurserymen will buy things from mere description by the grower, and sell out again without knowing or caring how they turn out. To return to the *Pansey*. We have already given the properties of a good one, but the following very short hints in selecting from the seed-bed will be of use:—Roundness, flatness, smoothness of the edge, thickness of the petal, and size. With regard to colour, which is a mere matter of taste, we stood alone once, because we hold two or three points to be indispensable. We have made many converts, and we only require people to put one of our samples by the side of some of the thousand trumpery things now out, and they will see the marked difference. The ground, which is the centre colour, should be alike in all their petals, without a shade of difference,—pure white, pure straw-colour, or pure yellow; whereas, many of the varieties esteemed by some have two or three shades, light yellow and dark yellow, white and straw-colour, or what not, and they are bad, nay, they are worthless. Let any person of taste look at a stand of Heartsease, and select one that has a clear centre all of one colour, and he will see at once that, on comparison, all the clouded or shaded centres are dull and commonplace. We care nothing about the marking, but it should be uniform, and the more contrasted with the ground the better; on this account dark eyes are generally the most striking.

#### PROPAGATION OF TREES BY CUTTINGS

##### IN SUMMER.

WHEN a cutting of any deciduous tree is planted in autumn, or winter, or spring, it contains within it a portion of the true, as it has been called, or vital sap of the tree of which it once formed a part. This fluid, relatively to plants, is very closely analogous to the arterial blood of animals; and I shall therefore, to distinguish it from the watery fluid, which rises abundantly through the alburnum, call it the *arterial sap* of the tree.

Cuttings of some species of trees very freely emit roots and leaves, whilst others usually produce a few leaves only and then die; and others scarcely exhibit any signs of life: but no cutting ever possesses the power of regenerating, and adding to itself vitally, a single particle of matter, till it has acquired mature and efficient foliage. A part of the arterial sap, previously in the cutting, assumes an organic solid form; and the cutting, in consequence, necessarily becomes, to some extent, exhausted.

Summer cuttings possess the advantage of having mature and efficient foliage, but such foliage is easily injured or destroyed, and if it be not carefully and skilfully managed, it dies. These cuttings (such as I have usually seen employed) have some mature and efficient foliage, and other foliage which is young and growing, and, consequently, two distinct processes are going on at the same time within them, which operate in opposition to each other. By the mature leaves, carbon, under the influence of light, is taken up from the surrounding atmosphere, and arterial sap is generated. The young and immature leaves, on the contrary, vitiate the air in which they grow by throwing off carbon; and they expend, in adding to their own bulk, that which ought to be expended in the creation of shoots. This circumstance respecting the different operations of immature and mature leaves upon the surrounding air, presented itself to the early labourers in pneumatic chemistry. Dr. Priestley noticed the discharge of oxygen gas, or dephlogisticated air (as it was then called) from mature leaves. Scheele, making, as he supposed, a similar experiment upon the young leaves of germinating beans, found these to vitiate air in which they grew. These results were then supposed to be widely at variance with each other; but subsequent experience has proved both philosophers to have been equally correct.

I possess many young seedling trees of the *Ulmus Campestris*, or *Suberosa*, or *Glabra*, for the widely-varying characters of my seedling trees satisfy me that these three supposed species are varieties only of a single species. One of these seedling plants presented a form of growth which induced me to wish to propagate from it. It shows a strong disposition to aspire to a very great height with a single straight stem, and with only very small lateral branches, and to be, therefore, calculated to afford sound timber of great length and bulk, which is peculiarly valuable, and difficult to be obtained, for the keels of large ships; and the original tree is growing with very great rapidity in a poor soil and cold climate.

The stem of this tree, near the ground, presented, in July, many very slender shoots about three inches long. These were then pulled off and reduced to about an inch in length, with a single mature leaf upon the upper end of each, and the cuttings were then planted so deeply in the soil, that the buds at the bases of the leaves were but just visible above the surface of the soil. The cuttings were then covered with bell glasses in pots, and put upon the flue of a hothouse, and subjected to a temperature of about 80 degrees. Water was very abundantly given; but the under surfaces of the leaves were not wetted. These were in the slightest degree faded, though they were fully exposed to the sun; and the roots were emitted in about fifteen days. I subjected a few cuttings, taken from the bearing branches of a mulberry tree, to the same mode of management, and with the same result; and I think it extremely probable, that the different varieties of *Camellia*, and trees of almost every species, exclusive of the *Fir* tribe, might be propagated with perfect success and facility by the same means.

Evergreen trees, of some species, possess the power or ripening their fruit during winter. The common Ivy and the Loquat are well-known examples of this; and this circumstance, combined with many others, led me to infer that the leaves of such trees possess in a second year the same, or nearly the same, power as in the first. I therefore planted, about a month ago, some cuttings of the old double-blossomed white and Warratah *Camellia*, having reduced the wood to little more than half an inch in length, and cut it off obliquely, so as to present a long surface of it; and I reduced it further by paring it very thin at and near to its lower extremities. The leaves continue to look perfectly fresh; and the buds in more than one instance have produced shoots of more than an inch in length, and apparently possessing perfect health and much vigour. Water has been very abundantly given; because I conceived that the flow of arterial sap from the leaf would be so great, comparatively with the quantity of bark and album of the cuttings, as to preclude the possibility of the rotting of these.

The cuttings above described present, in the organization, a considerable resemblance to seedling trees at different periods, of the growth of the latter. The bud very closely resembles the plumule, and the leaf, the cotyledon, extended into a seed leaf; and the organ which has been, and is called a radicle, is certainly a caudex, and not a root. It is capable of being made to extend, in some cases, to more than two hundred times its

first length, by two articulations, a power which is not possessed in any degree by the roots of trees. Whether the caudex of the cuttings of *Camellia* above-mentioned, have emitted or will, or will not, emit roots, I am not yet prepared to decide; but I entertain very confident hopes of success.—*Hort. Trans.*

#### THE PRIZES FOR WARD'S CASES, OR MINIATURE GREEN-HOUSES.

THE fact of the Horticultural Society having offered prizes for these novelties renders it necessary that we should give as good an explanation of what constitutes the subject of the prize as can be obtained, and thus prevent any misunderstanding among the proposed exhibitors. Mr. Ward himself has been scarcely so explicit as Mr. Newman, the author of a *History of British Ferns*, who has in his introduction appropriately enough described the principle and explained the object of these toys in a very plain and intelligible manner; we say appropriately, because of all the plants that have been tried in these air-tight cases, Ferns seem to flourish most, and therefore form an important tribe as connected with the system. Mr. Edwards informs us of the nature of the cases, and shows by a course of ingenious reasoning how plants, though seemingly deprived of air, nevertheless thrive. He says, speaking of Mr. Ward,

"His plan, although improved, I may perhaps say perfected, by various accessories, depends primarily and fundamentally on protecting the plants from too free communication with the outer air. This end is obtained by the use of glass, the light, so essential to vegetation, being thus freely admitted. The most ready way to try the experiment is, to procure a glass vessel, for instance, one of those jars used by druggists and confectioners; introduce some soft sandstone, or some light soil, filling one-sixth of the jar with it, and taking care that the earth be very moist, yet allowing no water to settle at the bottom of the jar; plant a fern in the earth, and then cover the jar with its glass lid, first supplying a slip of wash-leather round the rim of the jar, which will pretty nearly cut off the communication between the internal and external air; no further attention will be required: the fern will live, thrive, and probably seed, the seed also vegetating, and at last the jar will become too small for its contents; no watering is needed, the moisture in the earth will exhale, condense on the glass, trickle down its sides, and so return to the earth whence it arose.

"There is no limit to the application of this principle: instead of a jar, it is easy to construct in the window-sill, a box, extending throughout its entire length, the bottom and sides being lined with zinc, to prevent the moisture from damaging the adjoining wood work; then let the window be a double one, like those in Russia, leaving a space of six or twelve inches between the inner and outer glass. The ferns so planted in the box, which should contain a depth of five or six inches of light sandy earth, will soon fill up the space between the two windows, supplying the most beautiful curtain or blind that could possibly be invented. The plants need not be ferns exclusively, roses, fuschias, &c. would also thrive; but it must always be borne in mind, that plants requiring a humid atmosphere should not be inclosed with those which prefer aridity: of course the upper sash alone must be made moveable. Extending the plan still farther, a large conservatory may be constructed, or even a large garden, entirely inclosed with glass; all the doors should be fitted with great nicety and exactness, and would be better if double, and always one of them shut before the second is opened.

Houses on a large scale can scarcely be made sufficiently air-tight to prevent the escape of aqueous exhalations; a leaden pipe, pierced with small holes, should therefore be carried round the building, at as great a height as may be found practicable, and this pipe connected with a reservoir, so that an artificial shower could be produced at pleasure; if an increase of temperature were considered necessary, it might readily be attained by the introduction of hot-water pipes in the usual way.

So great is the advantage of this plan, that the plants of tropical regions can now be cultivated in London with the most perfect success; and, what is of still greater importance, may be conveyed, uninjured by extremes of heat and cold, and without any additional supply of moisture, from the most distant parts of the earth. Mr. Ward, and Messrs. Loddiges of Hackney, have, in their glass cases, transmitted our plants to the most distant countries, and have received the same cases in return filled with valuable exotics, many of which have never previously reached this country in a living state.

But the most pleasing character of this mode of cultivation is, that it can be adapted to any spot that fancy may dictate: plants in this way may be grown in a drawing-room, without ever making the least litter or apparent untidiness, and without the trouble attendant on watering. If the cases were opened annually, it would be sufficiently

often, and the decayed fronds, or a too luxuriant growth might be removed, and a little water added, if there appeared a necessity for it.

Ferns, mosses, and all kinds of cryptogamous plants, seem to spring up spontaneously in these cases; and the surface of the earth speedily becomes clothed not only with a beautiful but a highly interesting vegetation. The raising of Ferns from seed, in the manner hereafter described, offers a ready way of ascertaining beyond question the value and limits of each species.

It has often been considered somewhat unaccountable that plants should thrive when deprived of air. I believe a philosopher would smile at the idea of a vacuum existing in a vessel containing abundance of earth, water, and living vegetables; but let us consider the subject, without reference to any philosophical inquiry. It must, then, be understood as an unquestionable fact, that in closing the vessel no attempt is ever made to exclude the air which it contains, or even by any experiment to diminish its quantity; therefore, admitting the property of air to press equally in all directions, we must take it for granted that there is as much air in the vessel as there is in an equal space outside the vessel; and so, the idea that the ferns are living without air not being based on fact, requires no refutation. The next source of wonder is, that a fern should thrive deprived of that fresh air, or that change of air, which, in a state of nature, it is constantly enjoying. The term *fresh air*, though so continually used, has no very definite meaning. If it applies to air that has not been breathed by animals, I believe we shall find that animals alone are injured by respiring air from which oxygen has been abstracted by previous respiration: change of air, whether beneficial or otherwise, does take place, for our contrivances, although they retard, cannot preclude a change. Thus the supposed anomalies of plants living without air, or without change of air, are either dissipated or softened down: we will inquire whence arise the benefits of this plan.

In London, the air is loaded with particles of soot, than which there is scarcely any substance more injurious to vegetation; a single "smut," as it is usually called, causes a yellow mark wherever it has adhered to a leaf; and the result of an atmosphere loaded with smuts is the rapid destruction of the leaves, so that the leaves of London trees are never in a perfectly natural state; they differ in appearance, colour, and *health*, so to speak, from the leaves of country trees: the deleterious effects of London smut on the leaves influence the growth of the tree itself, and

London trees are invariably of slower growth, and of less healthy appearance than those in the country. By the plan of cultivating plants in closed vessels this injury is entirely avoided; the smut and all solids borne by the atmosphere being completely excluded, and forming a thick deposit on the glass; if the vessel employed be a bell glass inverted over the plant, then every accession of atmospheric air must take place through the earth, and consequently no portion of its impurities will be deposited on the plant. Mr. Ward is perfectly right, when he attributes the sickly state of *London* vegetation to "the depressing influence of the fuliginous matter with which the atmosphere in which he lives is surrounded:" but it appears that other causes have been sought in the presence of gases injurious to vegetable life. This theory I shall now examine.

Mr. Ellis, in an excellent paper read to the Botanical Society in June, 1839, and since published in the *Gardener's Magazine* for September,\* objects to the idea previously expressed by Mr. Ward, of the deleterious influence of this smut or fuliginous matter; and goes on to explain at length, that "the real mode in which such an atmosphere proves injurious to vegetation was first shown by Drs. Turner and Christison, which were published in the ninety-third number of the *Edinburgh Medical and Surgical Journal*. They ascertained that it is not simply the diffusion of fuliginous matter through the air, but to the presence of sulphurous acid gas, generated in the combustion of coal, that the mischief is to be ascribed. When added to common air, in the proportion of  $\frac{1}{1000}$  or  $\frac{1}{10000}$  part, that gas sensibly affected the leaves of growing plants in ten or twelve hours, and killed them in forty-eight hours or less. The effects of hydro-chloric, or muriatic acid gas, were still more powerful, it being found that the tenth part of a cubic inch in 20,000 volumes of air, manifested its action in a few hours, and entirely destroyed the plant in two days. Both these gases acted on the leaves, affecting more or less their colour, and withering and crisping their texture, so that a gentle touch caused their separation from the footstalk; and both exerted this injurious operation when present in such minute proportions as to be wholly inappreciable to the animal senses. After having suffered much injury from these acid gases, the plants, if removed in time, will recover, but with the loss of their leaves. Hence, in vegetation, carried on in a smoky atmosphere, the plants are rarely killed altogether, but

\* The *Gardener's Magazine*, conducted by J. C. Loudon, vol. xv. p. 488.

merely blighted for the season: accordingly, in spring, vegetation recommences with its accustomed luxuriance; and as, in many situations, there is at that season, and through the summer, a considerable diminution in the number of coal fires, there will be a proportionate decrease in the production of sulphurous acid gas, and consequently less injury will be done to plants during that season. In winter, too, when coal fires mostly abound, and gas is most abundantly generated, deciduous plants are protected from its noxious operation by suspension of their vegetating powers; but the leaves of evergreens, which continue to grow through that season, are constantly exposed to its action when present in its greatest intensity. Accordingly, in many of the suburban districts around London, especially in the course of the river, where new manufacturies are constantly rising up, the atmosphere is so highly charged with noxious matters, that many deciduous plants, and almost all evergreens, cease to flourish, or exhibit only a sickly vegetation. In an interesting biographical sketch of his late lamented friend Dr. Turner, Professor Christison confirms, by subsequent experience, the opinion formerly given respecting the noxious operation of the sulphurous and muriatic acid gases on plants; he describes their action as so energetic, that, in the course of two days, the whole vegetation of various species of plants may be destroyed by quantities so minute as to be altogether inappreciable by the senses. On two occasions he was able to trace the identical effects of the same kind of works (the black ash manufactory) on the great scale which his friend and himself witnessed in their researches. In one instance, the devastation committed was enormous, vegetation being for the most part miserably stunted, or blasted altogether, to a distance fully a third of a mile from the works, in the prevailing direction of the wind."

These particulars are full of interest, but no one should attempt to select ferns or grow them until they shall have read Mr. Edwards's book through.

#### THE TREES AND SHRUBS OF NORTH AMERICA.

NOTES OF A COLLECTOR, 1733.

THE spontaneous shrubs of this country are, the lark-heel tree; three sorts of honeysuckle trees, the first of which grows in branches, as our pimento tree doth; that is, always in low, moist ground; the other grows in clear, dry land, the flower more cut and lacerated; the third, which is the most beautiful, and, I think,

the most charming flower of its colour I ever saw, grows betwixt two and three feet high, and for the most part by the side of a swampy wood, or on the banks of our rivers, but never near the salt water. All the sorts are white; the last grows in a great bunch of these small honeysuckles, set up on one chief stem, and is commonly the bigness of a large turnip. Nothing can be more beautiful than these bushes when in their splendour, which is in *April* and *May*. The next is the honeysuckle of the forest; it grows about a foot high, bearing its flowers on small pedestals, several of them standing on the main stock, which is the thickness of a wheat straw. We have also the woodbind, much the same as in England; prince's feather, very large and beautiful in the garden; tres-colores, branched sun-flower, double poppies, lupines of several pretty sorts spontaneous; and the sensitive plant is said to be near the mountains, which I have not yet seen. Saf-flower; and, I believe, the saffron of England would thrive there if planted. The yellow jessamine is wild in our woods, of a pleasant smell. Evergreens are here plentifully found, of a very quick growth, and pleasant shade; cypress, or white cedar, the pitch pine, the yellow pine, the white pine, with long leaves; and the smaller almond pine, which last bears kernels in the apple, tasting much like an almond; and in some years there fall such plenty, as to make the hogs fat. Hornbeam, cedar (two sorts), holly (two sorts), bay tree (two sorts), one the dwarf bay, about twelve feet high, the other the bigness of a middling pine-tree, about two feet and a half diameter, laurel trees, in height equalizing the lofty oaks; the berries and leaves of this tree dyes a yellow; the bay berries yield a wax, which, besides its use in surgery, makes candles, that in burning give a fragrant smell. The cedar berries are infused, and made beer of by the Bermudians; they are carminative, and much of the quality of juniper berries. Yew and box I never saw or heard of in this country. There are two sorts of myrtles, different in leaf and berry; the berry yields wax that makes candles, the most lasting, and of the sweetest smell imaginable. Some mix half tallow with this wax, others use it without mixture; and these are fit for a lady's chamber, and incompared to pass the Line withal, and other hot countries, because they will stand, when others will melt, by the excessive heat down in the binacles. Evergreen oak, two sorts; gall-berry tree, bearing a black berry, with which the women dye their clothes and yarn black; 'tis a pretty evergreen, and very plentiful, growing always in low swampy grounds, and amongst ponds. We have a prim or privet, which grows on the dry, barren, sandy hills, by the sound side; it bears a smaller sort than that in England, and grows into a round bush, very beautiful. Last of bushes, except savine, which grows every where wild, is the



famous yaupon, of which I find two sorts, if not three. I shall speak first of the nature of this plant, and afterwards account for the different sorts. This yaupon, called by the South Carolina Indians, cassenna, is a bush that grows chiefly on the sand banks and islands, bordering on the sea of Carolina; on this coast it is plentifully found, and in no other place that I know of. It grows the most like box of any vegetable that I know of, being very like it in leaf, only dented exactly like tea, but the leaf somewhat fatter. I cannot say whether it bears any flower, but a berry it does, about the bigness of a grain of pepper, being first red, then brown when ripe, which is in December. Some of these bushes grow to be twelve feet high, others are three or four. The wood thereof is brittle as myrtle, and affords a light ash coloured bark. There is sometimes found of it in swamps and rich low grounds, which has the same figured leaf, only it is larger, and of a deeper green; this may be occasioned by the richness that attends the low grounds thus situated. The third sort has the same kind of leaf, but never grows a foot high, and is found both in rich, low land, and on the sand hills. I don't know that ever I found any seed or berries on the dwarfish sort, yet I find no difference in taste when infusion is made. Cattle and sheep delight in this plant very much, and so do the deer, all which crop it very short, and browse thereon, wheresoever they meet with it. I have transplanted the sand-bank and dwarfish yaupon, and find, that the first year the shrubs stood at a stand, but the second year they throve as well as in their native soil. This plant is the Indian tea, used and approved by all the savages on the coast of Carolina, and from them sent to the westward Indians, and sold at a considerable price. All which they cure after the same way as they do for themselves, which is thus:—they take this plant (not only the leaves, but the smaller twigs along with them) and bruise it in a mortar, till it becomes blackish, the leaf being wholly defaced. Then they take it out, and put it into one of their earthen pots, which is over the fire, till it smokes, stirring it all the time till it is cured. Others take it, after it is bruised, and put it into a bowl, to which they put live coals, and cover them with the yaupon till they have done smoking, often turning them over. After all, they spread it upon their mats, and dry it in the sun to keep for use.

#### THE CULTIVATION OF TRAILING PLANTS.

Mr. Paxton's *Magazine of Botany* is worth half the other works put together whenever a subject of practice is treated of, and, always excepting that the coloured plates outshine nature itself, it is the most perfect, and is, without any drawback, the most beautiful, of the embellished periodicals. Her Majesty's

acceptance of the nine volumes already out, and permission to dedicate the tenth to the Queen, was a proof of good taste, and a high compliment to the individual whose name it bears. It is one of the few works we can copy occasionally, in a way we trust that does the work no ill service, as by one article the reader may form a pretty good notion of the rest of the book. We now select a paper on Trailing Plants.

Trailing Plants are those whose stems spread horizontally and along the surface of the ground, only the points of the shoots ever curving upwards. They are also frequently called creepers. Many species that now rank as climbers might be appropriately arranged under this head; for although, by attention, they are induced to ascend, and to climb a greater or lesser height, they would, if left unheeded, creep along the earth, and lie completely prostrate. It is obvious, then, that numbers of climbers might be brought beneath the same treatment as trailers; but we would restrict the latter term to those dwarfier species which can be most fitly managed as real Trailers.

From their very humble nature, and their disposition to keep close to the ground, they appear to have been placed likewise in a low position as respects the amount of attention awarded them. Nevertheless, they have almost as strong claims to notice as climbers; and we have more than once striven to show that these last are among the most pleasing things in the whole vegetable world. They have the same slenderness and gracefulness of growth; and if these are not displayed so effectively, we hope to be able to make good the statement, that this is owing to their unfavourable and unsuitable treatment, and not to anything which they themselves lack.

They comprehend a considerable variety of plants; some being shrubby and some herbaceous, while a few are merely annual; and many being tender enough to require a greenhouse, others half-hardy, and the rest capable of thriving in an entirely unprotected place.

They are also adapted for various uses. In a common border or an ordinary pot, they make a pretty appearance. On rock-work, or spreading over sloping banks, or planted in the hollow of a rough piece of rock, and hanging over its edges, or mantling its surface, they are extremely interesting. Suspended in pots to the roof of a greenhouse, or the ceiling of a drawing-room in front of the window, they will have a delightful effect; and be similarly attractive when placed on pedestals, in the like situations, where their drooping branches may surround the pot, and be fully exposed to view. Planted along

the margin of a walk in a conservatory or stove, or on the top of a wall surrounding a pit, or other elevation in a similar structure, or to form a kind of natural undergrowth in a stove which has beds in it for containing tropical plants, and for growing them in a jungle-like manner, they are still more desirable. Another excellent office which they would fulfil is to compose an edging to flower-borders, or a broad formal band of flowers, within an edging of turf, or a spreading and lively covering to the ground beneath the plantations. While the best of all uses to which they can be put, is, in our opinion, the decoration of rustic baskets, vases, pieces of the trunks of trees scooped out so as to form a basin in the centre, and this basin filled with soil and Trailing Plants, or raised beds, bordered by piles of wood in a rustic manner, or, in fact, anywhere or in anything that is not too formal, where their branches will depend over the sides of some object, and be kept from touching the ground, and apparently mingling with the soil.

Of the mode of suspending Trailing or Half-climbing Plants in pots or baskets, in order to give variety and liveliness to the greenhouse and the stove, we have spoken, not long since, at considerable length, and need not now recur to the subject, save to observe that, while we then pressed the propriety of the practice on account of improving the aspect of plant-houses, and rendering them more diversified and gay, we would here advocate it for its exact suitability to the nature and peculiar habits of the plants. The beauty of a Trailer is entirely lost when it is standing amongst a general collection, even though it should be placed on a raised stage or shelf, and quite in the front of it. Its elegance and symmetry can only be shown by suspension. Of course there are a multitude of dwarf climbers, which, as we affirmed in the article above referred to, are equally or better suited for suspension in this way; but we shall not be far wrong in considering such species as genuine Trailers.

In cultivating Trailing Plants on plain flower borders, it should be the endeavour of the grower to raise each specimen on a little mound, formed of turfy earth, and about a foot square (more or less), according to the extent of ground which the species is adapted to cover. This mound may be about three, four, or six inches above the usual level, and just so large that the shoots of the plants may hang down over its edges, and show the true character of the specimen; otherwise it will have the tame, commonplace appearance of an ordinary herbaceous plant.

When Trailers are planted on rock-work—a system of treatment which is eminently ap-

propriate—they are generally put in crevices or hollows, which require all their growth to fill them, and the interest of the plants is thus hidden. Instead of this, they ought to be set in places where the soil can be made up nearly level with the rock, so that the very earliest extension of the shoots may be over that rock. Nothing is more charming than nice healthy shoots, clothed with inflorescence, lying over a rocky surface; and without some such contrivance as we have hinted at, this beauty cannot be attained.

But Trailing Plants may be put on rocks in another and more interesting way. In places where stone is abundant, plenty of rough pieces are mostly to be met with, having a depression or hollow on one side; and if some kinds of Trailers are furnished with a little earth in such a position, they will soon establish themselves, and flourish remarkably well. This is the case with several of the Sedums, and with the pretty wild Thyme.

Where small banks of earth exist on the sides of mounds, or on natural slopes, and it is desirable to cultivate them as flower-borders, Trailing Plants will be found particularly suitable. The smaller or stronger sorts can be employed, as the occasion may demand. In these instances, as well as on common borders, where the mounds we have described cannot be made, it will be advisable to put a few loose stones over the surface of the soil. These will support the stems and branches of the plants, and hold them up more prominently to the eye.

In conservatories which have the plants arranged in beds, and planted out therein, and in other houses that are furnished with raised pits, there is commonly a great baldness and nakedness about the sides of the walks, and an evident want of some lively edging. This might be readily supplied by a row of small Trailers, planted in a gutter on the top of the wall, or just within the wall in the one case, and also by a border of Trailers immediately within the curb-stone or artificial edging in the other.

We have seen numerous plants growing wild on the old walls about pleasure grounds, and contributing materially to take off their stiffness. We have likewise observed plants cultivated on the top of walls in some places, in order to take off the extreme straightness and regularity of their upper outline. But nothing would be so suitable nor so pretty in such circumstances as Trailers. Even Ivy planted in a gutter on the top of a wall, and made to form a kind of verdant crown to it, bringing it no lower than about two or three feet from the summit, would greatly relieve its formality.

As edgings to flower borders, where box or grass cannot easily be had, or would not be so desirable, Trailers answer admirably, because their growth is mostly regular, abundant, and capable of being trimmed to any extent. They are valuable, moreover, for placing inside (about six or nine inches from) a margin of turf to a flower-border, composing a band, which harmonises well with the grass verge.

We have hinted, however, that we deem them most worthy of being made use of for filling (or planting round the edges of) rustic baskets, vases, &c. In the modern style of flower-gardening, there is ordinarily a flatness, and consequent dullness or monotony about the beds, which offends the lover of picturesqueness. To remove or vary this, a few of the principal beds should be formed into raised baskets, the sides being composed of rough pieces of wood, with the bark uninjured. Or, where the beds are large enough, a portion of the centre of the most conspicuous and the largest should be so appropriated. It is over the edges of these that Trailers would show themselves to the greatest advantage. And the same objects would likewise make agreeable features on lawns. They are, we know, much employed in the latter localities: but it is the use of Trailers for them to which we now call attention. In more than one place, too, we have noticed retired parts of the pleasure grounds set apart to groups of rude vases, baskets, and heaps, made of old lumps of the branches, trunks, or roots of trees; and for covering these, or depending over their sides, Trailers would be exceedingly serviceable.

Of hardy shrubs, the common Ivy, the Periwinkles, the *Cotoneaster microphylla*, most of the Rock Roses and Sun Roses, and the *Daphne cneorum*, are excellent Trailers; while the more herbaceous species include most of the Sedums, many of the Verbenas, some of the Lobelias, several species of *Alyssum*, *Draba*, and *Aubrietia*, and those beautiful moss-like Lycopodiums, whose soft verdure constitutes such a lovely feature in the moister and shadier parts of conservatories and stoves.

We must not fail to note that there are many Trailers indigenous to Britain, which, like other native plants, deserve a far more extensive cultivation than they have yet received.

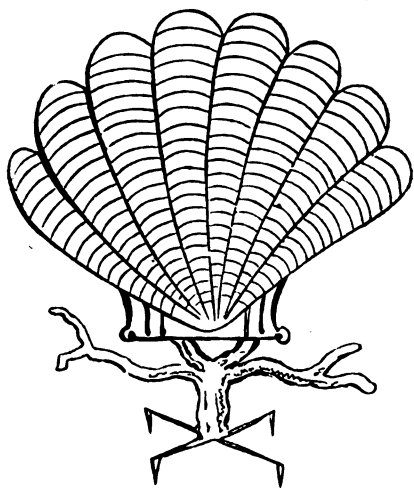
#### THE INFLUENCE OF GARDENING ON THE INDEPENDENT AGRICULTURAL LABOURER.

HITHERTO, in the rural districts of England, we have been so busily engaged in experi-

mentally solving the problem, "what is to be done with the labouring poor?" that we seem almost entirely to have forgotten another, but not less important, question—"what can we do for the independent labourer?" We perfectly remember Earl Spencer, at one of the preliminary meetings of the English Agricultural Society, laying down, as one of the fundamental objects of the Society, the improvement of the condition of the labourer; but the word "condition" is so vague, or rather admits of so many interpretations, that, after all, the object runs a risk of being neglected or wholly forgotten, for the want of being more definitely expressed. To arrive at his Lordship's precise intention we must look to the nature of the instrument, that is of the society, by means of which he would accomplish it. That society is not calculated to interfere with the condition of the labourer as far as wages, political privileges, or even education, in the abstract, are concerned. Its peculiar and sole province must be confined to improving the *habits* and enlarging the practical intelligence of the independent labourer, by cultivating and encouraging in him a taste for something more than the mere drudgery of the soil, and directing his attention to those simple arts which are capable of rendering his labour not only more effective, but more agreeable, by making it not only task-work for the hands, but occupation for the mind. When we speak of improving the *habits* of the labourer, we do not mean any direct attempt at the improvement of his *moral* habits—though that improvement would be the necessary consequence of the one which we do mean—we speak of habits of neatness, expertness, and emulation; and to encourage these the society must open to him new fields of recreative exertion, to which from indolence and ignorance, ninety-nine labourers out of a hundred, are strangers. We will give a simple illustration of what we are driving at. Go into any considerable village in the autumn, when the earth has ripened for man its fruits according to his industry, and ask what cottager is the best gardener in the place! Go into his garden, and observe with what care and neatness his various culinary seeds are preserved for the ensuing year. Remark with what exactness he keeps every thing clear as he goes, to save himself hereafter unnecessary trouble. See, too, how well his open ground is plotted out, so that none is lost or spoiled by one bed being in the way of keeping another in proper trim. Well, it will be asked, what is the annual profit which a poor man can by all this care make out of a few perches of ground? Go into his house, and you will find the answer there. You will

there find the same forethought in providing for the future, the same promptitude in having things done the moment they require doing, so that nothing wants the stitch in time that saves nine, and the same love of orderly arrangement which prevents things from being in the way, and renders his scanty apartment commodious and comfortable. The habits which enable him to live in cleanliness and plenty he has acquired in the garden; and if you doubt whether they are a little fortune to him, step into the garden of his next door neighbour. Seeds for the next year there are none; those he will have to buy in the spring. The ground already cropped is revenging itself upon him for his neglect, by rearing a host of nettles and thistles; and half the produce on that which remains to be cleared has been trampled upon and spoiled by having been awkwardly laid out. What do you expect to find in that man's house? You will find no flitch of bacon to carry him through till the next hog is properly cured in the spring; on the contrary, the walls are not only bare, but "coming down," the roof is leaky, chairs want bottoms, tables want legs; and, amidst those two evils, which always go together in a poor man's house—waste and want—you can hardly stir for confusion and dirt. Those to whom we appeal, well know that the contrast we have drawn has not been drawn from the imagination; and all the difference between the two characters arises from the habits acquired by the former in pursuing a recreation rather than a labour, which, by continual exercise, has trained his mind into the qualities we have already enumerated—forethought, promptitude, and order. Again, how often have we heard the most zealous despair over the impossibility of raising the intellectual condition of our agricultural labourers, from the difficulty of getting them to *read*. Go back into the decent cottage of our humble amateur gardener, and upon the well-polished side-table you will observe a little cone of books, with the Bible at the base, and the almanac at the apex. How is this? How came our favourite to be almost the only reading man of his class in the parish? In the centre of that little cone of books you will find an old book upon gardening. This was the introduction to the Bible and all the rest. The real difficulty is, to find a book sufficiently interesting to a labouring man to *set* him a reading. Give him a taste for gardening, and consulting some gardening book is so much a matter of necessity, that the work of reading is at once commenced. The pleasure of trying new modes and ways will lead him on, until the

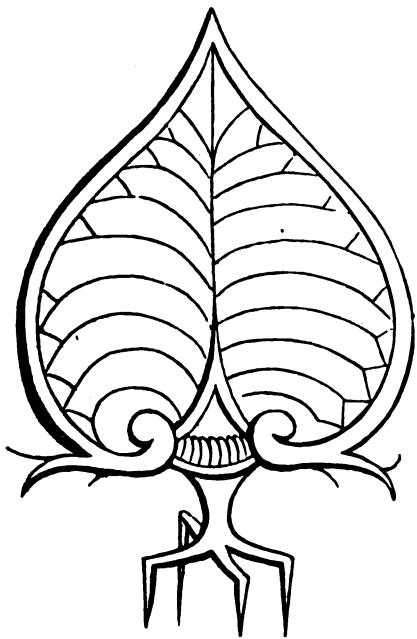
inquisitive powers of his mind are gradually awakened, and then no further persuasion is required to induce him to read whatever he can understand. Is not this the point at which those who are anxious to elevate the social character and condition of the agricultural labourer have been aiming? And have we not shown a clear and simple method, not founded upon any fanciful system, but deduced from the very circumstances in which the labourer is placed, for attaining it? If you wish to refine him, encourage in him a taste for the refinement of his own occupation. How they would contribute to his comfort, and we might say to his regeneration, has been demonstrated. The English Agricultural Society is just such a body as might, by example, infuse into our gentry a spirit for thus practically improving the condition of the independent labourer; and, surely, such a great and universal good is as worthy of their attention, as improving the carcass of a sheep, or introducing a new variety of grain.



CLIMBING PLANTS.

THERE is nothing more necessary to a climbing plant than appropriateness in the trellis to which it is to be trained. For a plant with large foliage, the supporting medium should be open. In one of small foliage, the trellis may be closer, but in all cases where the fancy is set to work to form a design, it is useless to elaborate the wire-work beyond that which can be displayed when it is covered. But there is room for taste in a design, and for all free growing plants provision should be made for its spreading towards the top fan-like, instead of, as many are fashioned, contracting, like the ordinary pyramidal supports, which are so common. The reason is

this: the plant as it grows throws out its side branches, which ought to be fastened to the trellis, but which are too often crowded to excess. How can it be otherwise, the plant is a single stem at bottom, it soon branches to two, thence to four, eight, sixteen, &c., until its branches are very numerous. Hence a trellis, like the above, is appropriate. On the other hand, suppose it were not so, and the trellis were contracted towards the top, the numerous branches would be confined, in each others way, crowded, and completely prevented from showing themselves or expanding their blooms.



#### THE FLORAL YEAR OF 1848.

As we commonly feel most interest in that which interests the most people, we naturally turn to the progress of Florists' Flowers during the year. And beginning with the earliest florists' flowers of the season—the auricula, nothing very remarkable, offers itself to our notice; in and near London this flower was fairly and fatally on the decline. The only exhibition worth notice in town was at the South London Florists' Show, at the Horns Tavern, and then nothing remarkable was to be seen; Gains, of Battersea, Dickson, of Clapham, and Wilmer, of Sunbury, appear to be the only persons worth mentioning who cultivate for sale within a reasonable distance of the metropolis, and of these, none but Dickson appear to have produced any

seedlings of merit. The Floricultural Society of London held what they called a grand show at the Crown and Anchor, but Dickson, who exhibited, found himself "alone in his glory"; therefore we saw none that we had not seen before. Mr. Lingard, at the Thatched House, Hammersmith, had perhaps the very best show near London, one of those cosey exhibitions, which end in a dinner, and at which the flowers are ranged down the table afterwards. However, as we did not dine with them, we merely guess that part of it; there were more shown than there had been at any other exhibition. The publication of lists of good ones to buy and directions to grow them easily, has done something towards inducing new ones to commence growing; and there is every chance of the cultivation of the auricula, near London, being increased. Dickson has put out several new flowers which rank as show varieties, for instance:—Matilda, Earl of Errol, and Unique.

Fletcher's Ne-plus-ultra has proved a good show flower, but there has been nothing further that was striking.

The Polyanthus, which comes nearly at the same time as the Auricula, seems neglected round London, while in the country it is thought a good deal of; and were the cultivators near town once to get into the way of growing it, the flower would soon be a favourite. The South London Society, as well as the Floricultural Society have endeavoured to revive the taste for it, but the growth is so bad of all that has been shown, that it is impossible to reconcile even the public to their participation in the prizes. There are no new ones produced worth mentioning, and the old ones have been so small and mean in appearance, that the best we have seen was not fit to exhibit, nor a bit like the blooms they exhibit in the country. This arises out of the pot culture, and its consequent starvation. If people wish to succeed, they must either grow them in a shady or shaded border in the open ground, or thirty-two sized pots, and plunge them to the rim; but the open ground is best, and pot them up to exhibit.

The next flower that comes under notice is the Tulip, which has lost two-thirds of its cultivators round London within a very few years. Davey, Clarke, Slater, Strong, Charles Brown, Atkinson, Caulier, Lawrence, Goepell, and others, of first rate standing as growers, have died within a comparatively short time, and other first rate judges and cultivators have, from various causes, declined for a time to indulge in their fancy and favourite flower. The effect of this has been to throw all these splendid stocks of flowers (except Brown's and Lawrence's,

which are in the hands of their successors in business) on the market, and lower the price of many fine varieties. We doubt if we shall ever see Rutley's Queen sold by auction again for twenty-five pounds, or Pandora for twenty; but if times mend a little, there are many young fanciers whose means are now limited, but who would indulge to some extent had they the opportunity which an increase of trade would afford them. The show at Hampton has been suspended; the show of the Friendly Society, of which Mr. Goldham is president, though nominally held at the Greyhound at Dulwich, had not a single exhibitor; and the Floricultural Society, which, in a sort of struggle to produce a show, may have mustered a stray bloom or two, merely showed how utterly hopeless was their task. Among the newest and best of the flowers out, Salvator Rosa, a byblomen, very fine indeed, seems the best. Mr. Brown has a Bizare, rather promising, whose name we forget, but it was exhibited at the South London Florists' show, and was admired by the few who were there. We had some hope that a proposal made before planting time would have roused this branch a little. It was an invitation to the growers for sale to subscribe a few rows of bulbs each to be divided into prizes, planted the present year, so that people were to see what they were going for, and then to let as many shew as chose to pay 10s. 6d. each, for the chance of winning. Then, as an encouragement for the dealers to show, the amateurs' half guineas were to be divided into prizes, so that amateurs were to show for tulips subscribed for the purpose, and those who subscribed them were to show for money. Mr. Lawrence responded to the call, and we fully expected most of the dealers and large growers, such as Wilmer, Brown, Goldham, Jeffreys, Hooker, Johnson, Dickson, and several others would have followed Mr. Lawrence's example. However, one waited for the other, and the season passed off. We do hope, however, that the next season will see some such proposition carried out with something like spirit. The country people, who seem to be growing all sorts of varieties, long since thrown by for worthless by the London and Southern florists have carried on their shows much as usual, and the flowers that in many cases win, would hardly find a grower near town. The great, indeed the only point, of difference known between the Northern and Southern florists has been grossly misrepresented. The Southern people want all the exactness in the pencilling. The feather as distinct, the flame as uniform. Everything the Northern people want we want, but we require one thing more to save a flower from expulsion. It must be clean, or ~~we~~

should throw out the stand. If a flower be unclean in the North they do not throw out the stand; they do not look upon it as an insurmountable blemish, and we do. It is true, we want the form and marking right, but bad form and bad marking are blemishes to be looked at by comparison, while a flower with a foul bottom is not looked at. All the writing of all the Northern people cannot alter or gain-say this one sole difference that exists. They will give a prize to a foul tulip and we will not. This renders their descriptions suspicious; they pronounce a flower fine for the stage, that we should put under the table, and therefore, when we buy any of these flowers without seeing them first, we are nearly always disappointed. The only progress made in the country with this flower, has been in persuading some of the respectable Northern Societies to abolish the showing of flowers with foul bottoms, and appreciating more those which are clean.

The Hyacinth is paid less attention to round London than almost any other flower, and yet if there were a regular show established, there could not but be many competitors, because almost every body would get a good flower, even in the smoke of the city. The South London encourage it a little, but there has never been a good show since the Metropolitan Society suspended its operations. All the London seedsmen would be interested in giving prizes for them. There are favourite flowers which would, in almost all cases win, but it would be the most compact, clean, and well grown of that same variety; and the numerous specimens of all sizes and heights would create no small interest; upon the whole, cultivation of the Hyacinth increases every year, but there is no public demonstration of it, and we only see it at the dwelling-houses in glasses, or those of seedsmen. Let there be a show announced in London at a proper time, and there could be no lack of exhibitors. We shall resume this subject.

#### BEEES FOR COTTAGERS.

WHAT could prove a more valuable gift to a poor cottager's widow, having a family of children to bring up, than a hive or two of bees; they would be a source of continually increasing health. The master or mistress should at once purchase a sufficient number of hives to produce the number of swarms they wish to give away annually, with two to spare, the extra ones to be kept in case of the failure of the others, as well as for the production of a new stock for the proprietor, in order to the taking up of the old ones, of which, hereafter. We will suppose, for example, that the master wishes to give away

six swarms annually; he should then purchase eight hives, and place them on separate stools under the care of the gardener, or one of his under gardeners. If the stocks bought should prove strong, they will all throw off a swarm in May or June—six of the swarms to be given away, and two kept; so that at the end of four years, the master will have given away twenty-four valuable gifts, and increased his stock to thirty-eight strong hives. So, too, a kind man, the more he give, the more he has to give, because he has a blessing on what he has left. The eight old stocks should then be taken in the following manner:—The swarm that is intended to be kept by the proprietor, should be placed in juxtaposition with its parent hive. Let the person who has the management of hives, some fine day in the month of September, put on a dress made of muslin to cover his hat, face, and come down to his waist, having sleeves to fasten at the wrists, and two pair of woollen gloves; then lift the hive intended to be taken off its stool, and place an empty hive in its place, having previously smeared the top, inside, with honey; then move the full hive to a distant part of the garden, striking it several times gently on the ground in its progress, to force as many bees as he can to quit the hive; then, with a long thin knife, cut out each tier of comb, and place it on a dish, first sweeping all the bees off on to a cloth with the wing of a duck. The bees will hover about him some little time, but soon return to their old stool, and ascend to the top of the empty hive. At night spread a cloth on the ground, close to the hive, and gently turn up the one standing next to the one taken, and sprinkle some honey well on the bees, between the combs; strike the deprived bees out of their empty house on to the cloth; sprinkle them well with honey, and place the other hive over them; they will soon ascend into the full hive and become one family, after having helped one another to pick off the honey with which you had sprinkled them; the fact of their helping one another in their trouble makes them friends. The proprietor will thus become possessed of the rich treasures of the hive without the wilful murder of his little slaves, and have increased the value of his next year's gifts; for he may expect an earlier and much stronger swarm than if he had not united them; and this double stock will not eat more during the winter than if you had not added so many more hundred mouths; the reason is, that where there are many bees in a hive, they can keep themselves warm outside by hanging close together, instead of eating; as a poor man can, who keeps bees,

have a warm coat to his back instead of having recourse to the brandy bottle. After the hives have swarmed they should be raised by having a round or two of another hive placed under them to prevent their casting, which weakens them very much. But the better way would be, to have square wooden boxes made twelve inches square by nine high, with a hole at the top; and when they have swarmed, a small glass may be put at the top, capable of holding three pounds, which would prevent casting, and be a beautiful curiosity for the proprietor to show to his friends; and the bees would be well able to spare so small a deprivation if they weighed twenty-five pounds.—*Amateur.*

#### PLANTS, PRACTICE, AND PERIODICALS.

Being the spirit of all that appears worthy of record in the Horticultural press, in as few words as can make the full meaning intelligible; compiled (with original notes) by GEO. GLENNY, F.H.S.

*Changing the Colour of Flowers.*—The Common Primrose will become blue when grown in soot, if one shown me some time since had no other application to its roots. Alum in solution applied occasionally to the roots of the Hydrangea renders its flowers blue. Muriate of ammonia, and the salts of iron, increase the intensity of red flowers. It is a curious subject, and not undeserving of farther experiments.

*Charcoal in Plants.*—A light seems to have broken in upon the people who have been splitting straws about the composition of plants. Mr. Riggs' recent publication seems to demonstrate pretty clearly that plants exist chiefly on carbon, and plants have been found to thrive wonderfully in charcoal, which is in fact carbon. Whether they take carbon by the absorbents of their roots or those of their surfaces, will serve the speculators to write about some time to come, and one writer devotes a large space to it already. The conclusion that charcoal is beneficial to plants is treated almost like a new discovery, and as a sort of triumphant conclusion to a long article, one writer asks, "why there should not be kilns erected for converting all the rubbish of a garden into charcoal?" as if the burning of the rubbish, the application of wood ashes, the charring of turf, were operations not as old as agriculture itself. Our ancestors knew the efficiency of charcoal as well as we know it, though they never troubled themselves about the why for the wherefore. Plants want carbon, they take it largely from the atmosphere, and whether they receive any through their roots or that which is generated there is arrested as it is

given off is a matter of small consequence. Mr. Riggs' experimental researches abundantly prove that plants live on carbon, that they are composed of a large portion of charcoal. It is certain that burned or charred vegetation is exceedingly beneficial to plants of all kinds from the spreading of burned weeds to the mixing of the charcoal of commerce in the soil.

*Pit heated with Warm Water in Gutters.*—Some people have been using hot water gutters in chambers below the soil to heat pits, and have had the surface of their mould quite flat. By giving the surface a gentle rise, say the back to be a foot higher than the front, we are told a circulation of air takes place, the heated air ascending from the front to the back, and then falling at the back and passing down the slope of the mould to the front, and this circulation is to keep the plants from the damp. This is pure theory, where the surface is all of one heat as it is over a hollow chamber, heat ascends from the entire surface, and there is no direct current or circulation of air. To make the heat unequal, it is recommended that the top of the gutter at the lower end be left uncovered, so that the heat should be greater there than at the back, but even that makes so slight a difference that the effect cannot be recognised; whereas, if there be a way left for the cooler air to go down behind the pit and under the chamber, and a vacancy between the front gutter and front that it might heat again, passing the hot chamber and front gutter according to the system of the late Mr. Penn, now carried out by Mr. Hill, of Lewisham, a circulation would be rapid, and the difference in the health of the plants, whatever they may be, would be manifest. The cold air ought not to have to pass among the plants, even if the plan recommended would effect it.

*One Shift System.*—Some writer, it seems, had detected a false statement which had been made in illustration of this system, and the great teacher of this rapidly declining novelty has come forward to acknowledge that a plant referred to as a specimen of its efficacy was not grown upon that principle.

*Manures.*—Robert Errington, of Oulton Park, communicates the result of many experiments with guano, charcoal saw dust, nitrate of soda, bone dust, pigs' blood, and many other nostrums, from which it appears that horse-dung or cow-dung, an inch thick on a square yard, produced, the former 9lbs. and the latter 10lbs. 8oz. of onions, while 8oz. of guano produced 11lbs. 8oz.; 2oz. of bone dust produced 10lbs.; guano, mixed with saw dust or charcoal did not produce more than 8lb. In growing parsnips, with all sorts

of odd things, guano included, the greatest produce was from old horse dung.

*Chrysanthemums* are recommended to be struck firm. The short branches, which shoot out of the old stems when the plants are cut down after blooming, the cuttings to be potted into sixty-size pots in light sandy soil, and give slight bottom heat; in a month pot them into thirty-two's, expose them to the sun, and when established cut them down to within two or three inches of the soil, to make them bushy; next shift them into eight's, and be left in the sun, well watered the rest of the season. With great deference to the critic, we would grow them on the plan mentioned in our Treatise, and show against him for his ears.

*Shrubberies.*—A writer, from whom we expected better things, states a singular proposition. He says it is contrary to nature to dig among trees and shrubs, "*because in nature we never find them so situated.*" With great submission to such high authority, such a reason is about as good as if he objected to blanch cellery, nail up a cherry tree, or prune a rose, "*because in nature we never find them so situated.*" Whether the objection to digging be good or bad has little to do with it, the reason given for it is downright bad, and we should seriously recommend to his serious consideration Sir Mathew Hale's advice to the country magistrate:—"Always," says Sir Mathew, "decide according to the best of your judgment, but never venture to state your reasons; your decisions may be right, but the reasons, have many chances of being wrong."

*Large Pine Apples.*—In a discussion upon this subject, a writer rather cleverly defends the growers of moderate sized pines, and makes very light of the merit to be attached to the growers of large ones. He mentions the case of a friend of his who had a Providence of eleven pounds weight, which made a great fuss about the place, and most people ascribed it to his great talent,—compliments which he rejected by owning himself inferior to them, and informing them it was a plant which went on growing instead of fruiting, until at last a fine fruit was the result, but he maintains there is more merit in producing three 3-lb. pines than one of 6 lbs.

*The Tortoise* is recommended to be kept through the winter in a mass of dry hay, sowed up in a mat or piece of old carpet, or in a basket of hay laid on its side. It is said when they are allowed to bury themselves they become a prey to parasitical animals.

*Van Mons. Leon Le Clerc Pear.*—J. Leconteur, of Jersey, writes a good character of this Pear. Turning to the fourth volume of



the "Gardeners' Gazette," we find at page 267, the following opinion given before it was much known. After describing its form, it is added, "It proves a pear of first-rate excellence, combining the properties of large size, handsome appearance, and rich flavour."

*Dahlias*.—A correspondent of one of the works has been favouring us with an elaborate description of a number of Dahlias long since discarded, for what purpose it is not easy to conjecture. There is also a list of better ones mentioned but not described, apparently taken from the "Gardeners' Almanac;" and great labour is bestowed upon an attempt to connect two or three of the better ones with the late Floricultural Society. There happened to be very little room the last season to go wrong, for we gave our opinion pretty early, and both the paper and the society had only to copy us. After we had decided upon the qualities of Standard of Perfection, it was astonishing to observe how readily the small fry of judges decided upon its character.

*Digging among Shrubberies* is condemned by an anonymous correspondent of the newspaper, not for the same reason adduced by another writer and already noticed, but on account of cutting the roots. We have always recommended forking, which, if carefully done, will not injure the roots.

*New Ash*.—Mr. Mason, of Neckton, Norfolk, writes that he has had a branch of an Ash tree come quite different in habit from the rest of the tree, and that he has succeeded in grafting it on the common Ash. The Horticultural Society want a plant of it at their rooms, Regent street. Mr. Mason, if wise, will keep it until he has enough to serve all his orders.

*Flower Gardens in Winter*.—J. I. Snow ridicules the idea of sticking bows all over a flower bed however neatly they may be trimmed. He says as soon as the summer flowers are destroyed, he clears the bed, and plants them full of the Poppy, Anemones, Crocuses, Snowdrops, Jonquils, Arabis, Verne and Albida, Hepaticas, Squills, &c. This accords with our lessons in the Garden Practice for Flower Borders, except that we have shrubs intermixed.

*Earthen Pipes*, which have been used with great effect for heating pits in the olden time, are mentioned again as economical means. In a very old house, which we saw a few years since, a complete row of these formed the flue to a moderate sized furnace, and had lasted years without breaking, effectually heating the atmosphere within a very short time of lighting the fire. The joints are made with common cement.

*Guano*.—Mr. Ritson, of Sunderland, has given a lift to one particular description of Guano, and attributes to the use of it a superiority in his crops over those of all his neighbours. Of course, as it is the leading topic of the day, if any man can attach his name to it, and persuade people that his is better than any other, it will be a profitable speculation.

*Mr. Brand* has been lecturing at the meeting of the Royal Agricultural Society, upon the subject of clay and lime. The lecture was ingenious; and, in mentioning Guano, the lecturer attributed its efficiency as a manure to the phosphate of lime it contained.

*Black Vegetable Dye*.—We have an account of a recent discovery in the Shand country, adjoining the Burmese territory, of a plant which yields a valuable black dye, much used by the natives. The manufacture is conducted the same as that of indigo.

*Dahlia Coccinea*.—The French papers make a wonder of M. Pepin having obtained a double variety of *Dahlia Coccinea*. Verily, if he could see how the florists here knock about the pretended species of the botanist, and how they had accomplished this wonderful feat of producing double varieties of *Coccinea* thirty years ago, he would stare. It is the ridiculous manner in which mere seedling varieties of a newly-introduced thing are trumpeted forth as species, that leads to the constant necessity of obtaining the names of even popular plants.

*Messrs. Loddiges* have erected a new span-roofed house, with a tank forty-five feet long, four feet and a-half wide, and two feet deep, with a partition down the middle to regulate the flow and return of the water. Within six inches of the top there is a slate stage on bricks, leaving eighteen inches hollow below, and six inches to hold silver sand, to plunge the pots in. The tank is half full of water, leaving nine inches vacancy between the surface of the water and the false bottom above it. The height of the water is regulated by a ball, which swims on the surface, shuts off the supply as it rises, and opens it as it falls. The house is altogether very complete.

*Grafting the Vine*.—The Editor of the "Gardener's Chronicle" has shown the dreadful disadvantage of depending upon theory in a positive and unqualified assertion, that "Vines cannot be grafted except when they are in leaf," because, now mark the theory, "at any other time the bleeding prevents a union between the stock and scion." Now for our practice against this theory. Mr. Gowans first awakened us to the idea of grafting the vine before a leaf was to be found, or even the buds bursting; his plan

was to graft the last year's wood upon the last year's wood, and he had grapes on the graft the same year. We followed his directions, and fully succeeded, but the buds made wood instead of fruit, and in all cases did well. As a further contradiction to the absurd theory of the bleeding preventing a union, we direct attention to Mr. Gowan's communications in the "Gardener's Gazette," Vol. II., where he refers to Mr. Smith, Gardener at Hopetown, Mr. McDonald at Dalkeith, Mr. Shields at Erskine, Mr. Cruickshanks at Killermont, Mr. Smith at Callender House, Dr. McNeil, Secretary to the Edinburgh Horticultural Society, and to the books of the London Horticultural Society itself, whence in 1835 he had a number of cuttings, and sent them fruit, gathered from his grafts. We do not feel bound to notice all false theories, but this being in direct contradiction to the directions which are contained in a treatise recently published in this work, it was due to the writer to show how pointedly and rashly the Editor of the "Chronicle" had condemned that which he evidently does not understand.

*Poor Soil.*—It is not much of a novelty, but we are informed that the best dressing for a poor soil intended for a garden, is half rotten stable-yard dung and a few cart loads of marl.

*Maple.*—The quickest way of propagating the Maple is said to be by layers, but the best way is from seeds.

*Auricula.*—Doctor Horner, who wrote a treatise on this flower, in which every point of good management had been taken from what we had written years before, has taken upon himself to answer a grower, who asks, why his plants have been rotting? and informs him that one reason is, because he does not read the said Dr. Horner's treatise, and then tells him, he should repot his plants annually, taking care to shorten the tap root to within an inch or an inch and a half of the insertion of the leaves; secondly, he should fill the pot nearly one-third with broken crocks; thirdly, stand his pots in summer and autumn in a shaded airy part of the garden, and elevated two feet above the ground; and fourthly, place them in winter and spring in a frame of a particular pattern invented by Doctor Horner. What then? "*q. e. d.* He will have no more rot in his auriculas." This is deceiving a young grower altogether, not one of these points relate at all to the rot in the Auricula. Mr. Wilmer, who attended to all such directions lost something like three thousand plants by rot. Mr. Dickson who grows all his upon the ground in common garden lights has for years possessed the most

healthy stock in England. The disease is occasioned by the soil. Mr. Wilmer discovered that he had in his compost a material that was too rank and exciting. As a proof that (however desirable it may be to examine roots and cut off decayed portions) it is bad management, arising from improper compost, as much as anything that produces decayed roots. Auriculas in simple compost will grow for years without a change, and though stragling and ugly, the roots will be sound and perfect as at first. And we do not wonder at the writer endeavouring to sell his whole stock if they were in a state to require the process. The great, the unerring principle to guide us in the culture of the Auricula is the adoption of sweet and clean and simple compost; loam and cow-dung; we have grown and bloomed them successfully in it for years, beating all those who had a more exciting medium, beating them in the growth and colour of the foliage as well as the flower, and healthier plants were never seen. Nothing tends so much to deter people from growing the Auricula as the difficulties which those who pretend to teach make where there are none. No man ever need grow Auriculas better than Hill of Hammersmith, and Dickson of Clapham, yet they had no contrivances like the Auricula house described and recommended by Dr. Horner; they had nothing but the most common garden frame and light; the plants stood in the ground, the compost was simple, and hundreds would cultivate the beautiful varieties of this universal favourite if they were not deterred by the seeming obstacles placed in their way by empirics and theorists.

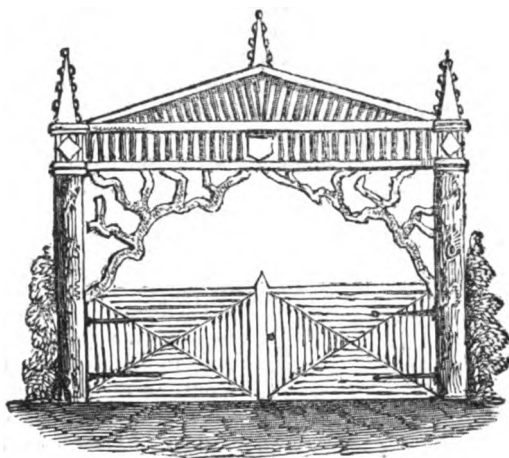
*Louise Bonne of Jersey.*—A pear introduced through the Marquess of Ailsa to the Horticultural Society in 1820, is, in a note by R. Thompson, said to be a great improvement on the Louise Bonne of France. It will succeed better in northern counties than the Marie Louise, and is worthy of a place in every collection.

*Acassia.*—We are reminded of the value and beauty of this tribe. It must be confessed that the foliage and bloom are handsome, the growth rapid, the wood hard and durable. It is as good as oak for gate posts, but when growing it punishes the ground and rots everything near it.

*Sham Shrubs.*—A Mr. Peter McKinsy actually defends the recommendation of a late writer, to cut off branches of evergreens, trim them up, and stick them in the ground to imitate real shrubs, a trick we hope at present peculiar to the gardens of few who pretend to grow.

*Ringleader Cucumber.*—At a recent meeting of the Horticultural Society, Mr. Stewart exhibited two specimens of the above, one which had been watered with nitrate of soda, the other grown in loam with charcoal. One was prickly, the other merely smooth, the newspaper says, “thus shewing that a cucumber may be considerably altered by the use of different manures, although treated in

other respects in the usual way as regards soil and heat;” query, is it not much more likely that there is a distinct variety in the two seedling plants, a very frequent occurrence; for however careful we may be saving seed, it is impossible to answer for the correctness of either a cucumber or a melon, unless grown from cuttings.



RUSTIC GARDEN ORNAMENTS.

Rustic ornaments in and about gardens are not only very effective when well made, but they are so easily fabricated, and the material is so readily found on the premises, that much more should be done in that way than we ever see attempted. In large premises there should always be seats in every place that offers the opportunity. The lopping of trees, pruning of orchards, and the appropriation of stray limbs in the shrubberies and plantations, will always provide a supply of material. The name rustic, as commonly accepted, means unprepared, rude, and unwrought wood; that is, any seat, table, gate, or other article made of limbs of trees in their natural state with the bark on, would be properly called rustic; and when they are placed in appropriate situations, they have the best effect, and offer great convenience round the boundaries. In the outer walks or roads of premises, there ought to be seats at certain distances, because many persons desire occasional rests, and unless a place be all laid out, and very uninteresting, there will be many spots which offer pretty views of the premises or mansion, surrounding scenery, which spots taste would select for seats. So also should there be arbours and coverings in case of sudden wet. These, whether made like a mere shed with four uprights and a

straw roof, or improved by filling up three of the sides solid, or formed like a gipsy's hut, or ever so elaborately worked, but should always be formed with wood that has its bark on. To assist in this kind of manufacture, care should always be taken when the wood is first cut to reduce it the most handy lengths; to save all elbows and oddly formed limbs, not to shorten any too much, and to waste none; for, besides these articles which takes pieces of particular length, there are others which will use up the shortest pieces, such as baskets to hold pots of flowers, or to hold the soil itself and have the flowers planted in them. Rustic edges to clumps, and other subjects too numerous and various to recapitulate here, and for such purposes, pieces that would appear too short for any thing will come in well. Suppose, for instance, we had a square box, rough as may be, that had come with something packed in it, make a stand for it, if it were only four stumps driven in the ground and then railed. On the tops of these get pins of inch or inch and a half through, cut into lengths, one inch longer than the box is deep; round one end a little, split them all, and nail them close to each other all round the box with the bark outside, and you have a rustic flower basket. Change your tackics a little, get a carpenter to make

you one of any form you please, an octagon, and smaller at bottom than top, and you have a smart and tasty affair. We have made two smart flower baskets with a butter firkin cut in half; and a fine oval basket of some importance, with an old cooler that was of no other service. In short, the splitting of short lengths to cover over any thing that is not fit to be seen is one of the very best as well as very commonest manœuvres and can be carried to great extent. In a series of illustrations, of which we now only give two, an entire gate to an orchard and a rude basket for flowers, we shall exemplify the extent, to which rustic work may be carried without much difficulty; and in other papers we may offer a few hints that will prove of great advantage to those who wish to indulge in so tasteful a mode of ornamenting a garden.



#### GLENNY'S GARDEN PRACTICE.

JANUARY is, perhaps, the most uncertain month in the year for gardening operations. In some cases it is all but a blank, a hard frost may set in, and pits, frames, greenhouse, and hot beds, require all the attention that can be given to keep out the cold, increase heat, and prevent damp. On the other hand, if mild, the same work that is open for October, November, and December, remains open for January, with little or no probable difference as to the result. Thus alterations in the gardens, planting of trees, bushes, shrubs, and flowers, the making of edges and walks, the formation of new clumps and borders, the pruning of trees, the laying down of turf, and other operations which may be conducted from September to April in mild weather, can always be done, and therefore beyond looking back to the directions for three months there is not a great deal to advise. However, I shall in each department offer a few hints that may be useful to the inexperienced, although there is the chance of the frost setting in, and rendering nearly all I say a dead letter.

#### KITCHEN GARDEN--JANUARY.

Dig over or trench all vacant spaces where the crops have come off, and when they

are nearly done, clear off the remainder, and put them in elsewhere rather than let the ground stand idle; for instance, if a piece of cabbages are nearly off, cut the remainder, take up all the stumps, and plant them close together in any spare place to form sprouts for the winter. Leave all dug or trenched ground rough or in ridges, to get the benefit of the frost when it comes.

*Peas and Beans* in small quantities, say a row or two, may be sown to succeed other crops, or to form a first if none are sown before; attend to the former directions for the mode of sowing.

*Cauliflower Plants*, under glass or shelter of any sort, must be carefully protected from hard frost by increasing the thickness of covering, whether it be mats or litter, or any other medium. Those out under hand-glasses must be covered close at night, and if a frost come, litter may be added. A waterproof cloth, covering a hand glass and reaching the earth all round the glass, is the most effective covering against the most severe frost; but ordinary frosts may be counteracted as far as these may be concerned by putting the glass close down to the earth.

*Lettuces and other Salads* in frames must not have too much wet; all dead leaves must be picked off, the plants thinned where they are too thick; sow as directed last month. Sow any or all the best sorts of lettuce, under a south wall, or on any warm border; or if you would hasten them, sow some on a dry sheltered spot, and cover it with a common two or three light frame and glass, according to the quantity, or sow some under hand-glasses, from which they may be pricked into a common bed, or into a warm border.

*Cabbage*.—When there is room to spare and there is any chance of cabbages being wanted, plant some of the strongest, either to grow and be eaten as coleworts, or allowed to remain and come to heart.

*Asparagus*.—You may continue to force, if you want more than you have provided for, but the best way will be to make a fresh bed. If the bed in which *Asparagus* or anything else is forcing has declined in heat, look to the linings as directed in a former article, and increase the heat, give additional water and air when the weather will permit.

*Hoeing and Stirring* the ground between the crops, and earthing up round the stems of cabbages, brocoli, Brussel's sprouts, &c., protects the plants a good deal against frost, as the more loose the surface of ground is, the less the frost penetrates; the earthing up refreshes and strengthens the plants.

*Cellery* earth up, selecting dry mild weather

for the purpose, and towards the end of the month put a pinch of seed into a pot to be reared in the frame for early plants.

*Forcing*—Mint, small salad, Radishes, and herbs, likely to be wanted green before their time of appearance in the open ground, are easily managed by putting small portions in pots to go into the hot-beds.

*Prepare Dung* for hot-beds and linings of hot-beds, by turning it over and shaking it out, and if it have dried much sprinkle it with a rose watering not all over occasionally, as you make up the heap.

*Cucumbers*.—To those who are content to have them in reasonable time, our directions are, to prepare a small hot-bed in which to raise the plants—from twelve to fifteen barrow-loads of good hot stable-dung will be enough for one light box; it should be well turned and shaken together every three or four days, until the heat is regular all through it. Three or four days after the bed is made, earth it three inches thick all over, then fill some pots with good rich earth, sow seeds therein, and plunge them two or three inches; as soon as these seeds are up, sow others for a succession, if you require them. See that sufficient air is given to prevent the steam from injuring the plants; and if the heat of the bed declines, line the sides and back with fresh hot dung. When the young plants are three or four days old, shift them into the pots in which they are to be nursed till planted out, taking care they have a little water of the temperature of the bed whenever they appear too dry.

*Melons*.—The same directions will apply as for Cucumbers for the present, although most persons commence later in the season. Cucumbers are frequently commenced much beforehand, and there are those who exhibit Cucumbers in January. This, however, is not consistent with the arrangement of a small garden, and a collection of almost everything; therefore in these directions I do not contemplate more than an ordinary season, except in cases where forcing is very simple, and worth the trouble, which, I confess, I do not think the case with Cucumbers.

*Rhubarb* may be forced by various means, by planting some in three or four inches of mould at the bottom of a butter firkin or small deep box, heading it up, and placing it in a hothouse, or surrounding it with a heap of dung: or putting a chimney-pot or earthen-pot, like one, over a plant, and surrounding it with hot stable dung, or keeping it in a warm dry cellar, or, in short, giving warmth and darkness, in any way the plant will grow.

The sweeping up of leaves, and laying

them in a heap to rot, the clearing all litter from the ground, and having all things clean and neat, are highly requisite at this dull season, for when the best is done, a garden is not too smart, but if it be sprinkled with fallen leaves, and remains of crops, it looks bad indeed; but all these matters, as well as what I have directed before, are mentioned as proper to be done if the weather be favourable; for, although it highly amused one, who fancies himself clever, to read in one of my articles a hint that if the ground was frozen hard seed could not be sown, I might go further, and say, if the ground is too wet, other things cannot be done; nevertheless, if the bad weather or the frost prevent these operations for a time, they must be done as soon as the weather will permit.

#### FLOWER GARDEN.

This department always provides work for each month. Frost or fair, there is something to do; and though extreme weather may change the whole, there will be something to do. If there be frost, there is the collecting of soils and manures, if you have not all you want; and there is the digging and turning it over if you have it laying in a heap. But nothing is so effectual in the ripening, or rotting, or ameliorating, any compost or manure, as removing the frozen surface and laying it by itself, as often as a surface is frozen. Neat's-dung, the most valuable of all manures to a florist, is never so valuable as when the surface freezes and is removed, as fast as it is frozen, until all is frozen and removed; the frozen parts are infinitely better for all purposes than that which has not been frozen, and is ready for use much sooner. The same, however, may be said of all composts and soils, from the stiff clay to the light fibry peat and the turfy loam.

*Ranunculuses*.—The compost in which Ranunculuses are to be planted should be thrown out of the bed at the beginning of this month, and thrown in a heap or ridge on each side the space hollowed out, the whole length. Should a frost come, the top surface may be chopped off into the bed, and if it freezes again the top may be chopped off again even, until the whole is returned to the bed, when it may be piled in a ridge of each side again, without waiting for it to thaw, for it will be more exposed on the sides than in the bed. The depth of the bed should be fifteen or eighteen inches.

*Tulips* will be spearing though the surface of the ground, and require great diligence to preserve them from danger by frost, for if that once gets hold of them from the time they are in the ground to the time they bloom

notched flowers, or blighted petals, are almost a matter of certainty. It was in this extraordinary care our forefathers beat us in the quality of our flowers, but were mostly obliged to support the stems. Most of our present growers may recollect to have seen seven uprights at each end of a bed, where silk cords used to be drawn tight from end to end for the Tulips to be fastened to by ties or otherwise. Others used to have sticks with wire hooks standing out from them, and easily shifted, to support a flower at any height, but with watchfulness and care not to have a cloth on except in frost and cold winds, nine seasons out of ten the Tulips, will support themselves; but to do this and prevent their drawing up they must be uncovered every hour, that there is no frost, and be watched like children. Where the bed is merely for growing the flowers as stock, it will do to put a cone of sand on each of the spears to cover them from the immediate effects of sudden frost, until the spring is further advanced. It is a common notion that the longer you can do without covering Tulips the better, and that it is impossible to hurt them while they are in the ground and do not appear. I am quite certain that the Tulip is hardy enough to bloom in spite of any frost; but any check, however slight, so damages the flower in embryo, that notches, split petals, roughness, blighted petals, and various other evils, not excepting even the flushing and spoiling the colours, are often the result of frost reaching the petals in a young state, when, in fact, they are less able to bear it than they would be in actual bloom; therefore, with all its disadvantages, cover against frost.

*Auriculas* must still be kept dry, that is to say, must have very little water, no more than will just keep the soil moist; the bottom of the frame must also be kept dry, and on a fine day all the pots should be moved out and the place swept out; dead leaves, and dirt, or anything than can create damp are greatly against this delicate flower in winter time; examine also every pot at the bottom to see if the holes are stopped, and if they should be found so, clear them out, and always if you see one pot more moist than another, examine the drainage, and above all things look well to the drip from the light, as too much wet will spoil the bloom for the spring; constantly take the lights off in mild dry weather, they cannot have too much air.

*Carnation and Picotees* require so much the same treatment that I should never hesitate at keeping both in the same frame.

*Pots of Cuttings* and store pots full of plants to turn out in spring, such as *Petu-*

*nias*, *Verbenas*, *China Roses*, *Fuchsias*, *Nemophylla*, *Stocks*, *Mignonette*, half-hardy annuals, autumn sown *Heliotrope*, and others do with very little water; they must not be altogether neglected, but should never be very wet, and should never have the rain; see also that there be no impediment to the water that goes through the pots draining away directly.

*Dahlias*.—Any that you are very anxious to make the most of, may be potted and put into the greenhouse or cold frame until the eyes swell, when you may put them into a hot bed used for any other purpose, such as where *Asparagus* or potted plants are being forced: examine the whole of the tubers that you have uncovered, to see if any are rotting, and if you find any symptoms of decay cut it away, and pot the tuber, which you may put in heat at once, if there be any danger, for they will often throw shoots before they are altogether spent, even when total decay is inevitable, which is generally the case when the decay is internal. I have taken a dozen cuttings from a bulb that was rotten inside, and which at length came right through the top skin of the tuber whence the cuttings had been taken. For the propagation of ordinary *Dahlias* we should do nothing this month. When the cuttings have shot far enough to enable you to take two clear joints off, and they are an inch from each other, cut close up to the second joint, and take off the two lower leaves with a knife, place the cuttings round the edge of a pot a good half inch in the soil, water them in gently, and place them in any frame that has a good heat in it; you may, if you please, sink the pot into a larger one, so that you can put a bell glass over them, to touch the soil all round outside the cutting pot, but in this case the larger pot must be plunged a little, to obtain a good bottom heat, which greatly facilitates the striking. Let the bell glass be wiped every morning, and moisture be secured to the cutting; as soon as the cuttings start in growth take off the bell glass, the light to the hot bed will be protection enough. When they are struck, all of which may be during the month, pot them carefully in small sixty-sized pots. The nature of the soil is not of much consequence, so it be light. The compost for any other flower will do for the *Dahlia*, up to the first shift or planting out.

*Anemones* of the single kind that were sown in autumn, are in all probability showing bloom or flowering. The double ones require protection, but as the single will almost bloom through snow, they are not of so much importance, and they assist greatly the appearance of the garden. If, however,

they are much exposed by their situation, a little litter of any kind may be used.

The planting of flowering trees and shrubs, and making alterations in gardens, dressing up the borders and clumps for winter, and such work as has been recommended for past months, all our advice may be compressed in three words, "lose no time." When the winters are mild, and there is scarcely any frost till Christmas, or afterwards, the buds of deciduous trees and shrubs swell, and every day renders them less likely to move without a check to their growth or bloom, although there is rarely any actual danger until the end of February, or even the early part of March. Turf will cut well, and if the grounds be not too much soddened with wet it will lay well. While the ground is in order for working, box edgings may be made as well this month as at any season. Pruning, also, will be as effective now among shrubs, and especially evergreens, as at any time; so, also, may gravel walks and roads be made, trees felled or lopped, or pruned, to make openings, where they interrupt an interesting view, and few people are aware of how much can be sometimes done by the mere removal of some tree, or limb of a tree, which shuts out the spire of a church, the turn of a river, a windmill, house, or merely a cottage from a distant landscape. These things can only be ascertained by clearly observing what intersects the distant scene from any part of the ground or house, from which a good view would be desirable; sometimes it will be found to be a tree on some other person's ground. In this case, it is often very easily arranged with the owner, and I remember once being concerned in an alteration, where a walnut tree on a neighbour's domain was a complete obstruction to one of the most beautiful distant landscapes I ever saw. When I pointed it out, I was told it was perfectly useless to make any attempt with the owner, who was farming his own freehold land, and though he loved money, he had a great antipathy to my Principal, and would rather have planted a wood to shut him out, than fell a tree to oblige him.

It was, however, so essential to the carrying of my object, and money so small an object to the Principal, that I was determined to make the attempt. Accordingly, I set out with an unlimited commission to buy walnut trees for their wood alone, and purchased one that was in a public-house garden hard by, took the landlord's advice as to where I could get any very large wood; several people were mentioned, and among others, the farmer, who came over and said I had given a good

price to the landlord for his, though a small one, and after a glass or two of wine, let me make him an offer for any I might see on his premises. Having marked several, and made memorandums, I came to the right and said I would give as much for that one, as I had talked about for all the rest together. I bargained for £50, felled the tree, sold the wood for £29 a few weeks afterwards, and the principal assured me he would rather have given £500 than not to have had the view, and looking at the effect in his own place, which was really valuable, I do not think he overrated the worth of the opening. I mention this circumstance to show that small considerations ought not to weigh against the improvement of that feature of a pleasure ground or mansion which is all important. Where then an eminence or other good place for an arbour, or seat, or temple, see if you cannot open a prospect. Where there is a fine prospect, place a seat, or arbour, or temple to view it from. There should, in fact, be always a resting place where there is a fine view, and a fine view ought to be laid open wherever there is an opportunity.

For other directions applicable to this department, consult the operations for the last three months, not only as to protection and other seasonable cautions, but also planting, pruning, propagating, and all other matters.

#### FRUIT GARDEN.

In this department of a garden there is little to do, if you have fulfilled the directions already given, and if the weather prove at all seasonable, and frost lays hold of the ground, the work will be all comprised in preparations; but there is one point worth taking advantage of in a lasting frost; if your walls are infested with vermin in the smallest degree, syringe the entire wall and the trees with clear water through a fine rose, until the wall is covered with ice.

There is hardly a pest that this does not totally destroy; it fills up the crevices which harbour all sorts of plagues, with solid ice, and though a cold job, and one which you must seize upon a very hard frost to perform in, it will save you immense labour in the season, for hardly a snail or slug, wood louse, chrysalis, or egg, will stand the freezing up in solid ice, and as the bottom of the wall, where all sorts of mischief is found in the greatest quantity, and the earth immediately adjoining it, becomes a mass of solid ice, all that are washed down from their holes, and from behind the branches of trees, to the ground, share the same fate as those frozen up in their places of refuge.

## THE NATURAL ORDERS.

If any thing could reconcile us to the natural orders, professor Johnson, the Lecturer on Botany, could find it; but, we have happened to listen to him with a determination to be convinced, if possible, that the natural orders are not unnatural; but finding he could not convince us, we gave it up. Now Professor Johnson did in his Lectures on the natural orders speak upon the subject as cleverly as anybody we ever heard, and we now wish to give our readers the benefit of the doctor's argument, although we confess we did not subscribe to them, and very reluctantly abstained from contradicting him on particular points. The following is the substance of one of his lectures, and will be followed by others, the lecture is upon the natural order Rosacæa, and is full of interest, whether we like it or dislike it.

Professor Johnson commenced a lecture on the Rose tribe, by observing that it was an extensive order, which had been variously divided and subdivided. The plants all belonged to the class of Icosandria, having an indefinite number of stamens on the tube of the calyx. They produce the most beautiful flowers and delicious fruits, and the countless host of varieties afford an endless and inexhaustible source of decoration to the flower-garden. To this tribe belong the strawberry, raspberry, apple, pear, peach, apricot, and almond; and, in fact, the whole range of fruits would be exhausted divested of them, with the exception of the currant and gooseberry. The tribe is divided into four sections, or sub-orders, of which the rose, apple, almond, and burnet, are the several types. Collectively, the calyx is four or five-lobed, and nearly allied to that of the last tribe which came before notice at the preceding lecture; but an universal feature is, that in the roses the odd segment is always turned to the main stem, whilst in the legumens it is always opposite to it. There are also three forms of seed, which are well characterised in the strawberry, apple, and plum.

The first division is the Rosæ, including the rose, the potentilla, and the spiræa. The first is the single genus *Rosa*, the fruit of which is fleshy, seated in the tube of the calyx, forming the hip, in which are the apparent seeds, each being an individual fruit. The calyx and seeds are always in fives, and the leaves are stipulate or fringed on each side, an arrangement which is common to all that belong to this tribe at some period of their growth. There are at least 200 species, nearly all of which are confined to the temperate zones, few being in the tropics, and none met with either in South America or Southern Africa.

No flower has been so much celebrated from the Chinese voluptuary to the bard of western Europe. It comprises every tint, from the purest white to crimson of the deepest die, and cannot be called unjustly the Queen of Flowers. The popular fondness for roses, and their easy cultivation, has caused them to prove an extensive and valuable source of speculation to florists, and there are probably more than 2000 varieties. Although the colour varies from the purest white to the most intense red, no blue has been obtained; for, although in some varieties there is a tendency to that colour, yet none has been discovered which, with yellow, would produce green. Some varieties produce a true yellow, and it never occurs that two primitive colours are found in one species or genus; and it would be equally impossible to produce a blue dahlia or a yellow China aster. The bark of roses is astringent, but is only used in tanning, or in medicine as a tonic. Those which are medicinally employed are the *R. Gallica* and *R. Damascena*, which are used more than any others in making the infusion and confection of roses. Rose-water is made from the leaves of the *Rose Centifolia*, or cabbage-tree rose, by distillation; and the otto or attar of roses is prepared from the same species, by steeping the petals in water. These are then exposed to the sun for some days, or a week, but in two or three days' time the oil will separate, which comes to the surface of the water in a film. This is then taken off by cotton wool tied to the end of a stick, which is squeezed, and the oil separated. Some idea may be formed of the labour of procuring it, when it is stated that 2 cwt. of petals are required to produce one ounce of otto, a circumstance which accounts for its dearness of price and extensive adulteration, as it is rarely found pure.

The Potentillas have the seed-fruits attached to a common receptacle, which enlarges, becomes fleshy, and, forcing them from their attachment, throws them on their surface, as in the strawberry. The raspberry and bramble is a curious modification, very little fruit being analogous to the strawberry, as here the little fruit enlarges and becomes fleshy. They are almost all herbaceous, and the stems of the raspberry and others are biennial; the leaves are in structure nearly like the rose, being sometimes compound and winged. The astringency is very powerful in this tribe, and one of them, the *Potentilla Officialis*, is perhaps the most so of any vegetable. It is used in the Orkney and Shetland Islands for tanning; but although the only plant in the section that is employed, many more are equally eligible as a substitute for bark.



None of the tribe are unwholesome, but there only two in this country which are edible, the strawberry and the raspberry: although other species are edible in the north of Scotland and the Islands, and in Norway, Sweden, and Finland, where they are nearly the only fruit that the inhabitants are able to maintain. The fruit of the *Spirææ* differs but little from that of the *Potentilla*.

The second sub-order is the *Poma* or Apple. The apple never contains more than five fruits, and as may be seen in making a section, instead of being so many distinct cells, they are all concentrated. Another difference by which they are distinguished by botanists, is in the fruit, which in the apple is erect, and in the hip pendulous. They are all aborescent, or form trees or shrubs; the bark is astringent and bitter, and the wood hard and close grained. Two of this species, the pear and the service tree, are well qualified and employed by mathematical instrument makers. The hawthorn makes good hedges, and has a Greek name which signifies hardness; it is also employed as wedges for splitting oak and elm. The fruit best known is that of the *Pyrus Malus* or apple, and the *Pyrus Communis* or pear. Each class is very numerous, and of pears, Don has estimated 667 sorts in England, which, with foreign varieties, may be estimated as at least 1000; whilst of apples there not fewer than 2000 varieties. Many of these are of course superior to others, but there were only thirty-six sorts of pear known by the ancient Romans. They are never so luscious here as in warmer climates; and, if the account of Marco Polo can be believed, in China apples grow to between 10 and 12 lbs. weight; on the Continent, however, they are produced larger and finer, from the great degree of light and heat. The apple is indigenous here, but, though it grows wild, the edible varieties are produced from foreign productions upon our austere crab. De Candolle and other botanists think that the various qualities are derived from two—the *Pyrus Acerba* or crab, which has the leaves and tube of the calyx very smooth, and is used for cider; and the *Pyrus Mitis* or sweet apple; but that these two have been so much crossed by cultivation that but little of their original traces remain. The quince, medlar, and service are all edible fruits of this variety, which are however nearly gone out of fashion, the taste of the people having altered.

The next sub-division consists of the *Amygdalæ* or Almond tribe, one important character of which is in the fruit, there being three distinct coats besides the seed, which

have obvious distinctions. An instance of this is afforded in the peach, where we have the rhind or skin; the sarco-carp or fleshy part which is eaten; and the stone which envelops the fruit. They are all shrubs or trees with simple alternate leaves, and white or pink flowers. All the fruits of the almond tribe contain hydrocyanic acid, which renders them more or less poisonous, and its presence was formerly considered a distinguishing character of this class. Its presence has however since been detected in the juice of a plant of the sub-order *Poma*, a native of the mountains of Nepaul, and which is found to destroy the goats and other animals browsing upon it.

This acid exists in many other species, and even may be detected in the pip of the ripe apple. It is found in the leaves of the *Spirææ*, and gives the peculiar odour to the meadow-sweet of our hedges. The bark is astringent, and the trees produce a similar gum to that of gun-tragacanth, which is known in commerce under the name of cherry-gum, and is not produced by any of the other sub-orders. This class includes the apricot and peach, of which nearly 100 varieties are known; the nectarine, with forty varieties; and the plum and cherry, each nearly 300: and, like the apple and pear, these have been long under cultivation. They are natives of the middle countries of Asia, including a square range, of which the Caspian, Black, and Mediterranean Seas, and the Indus, are the lines. The peach is a native of Persia, the apricot of Armenia, the plum of Syria, and the cherry of Asia Minor. In the time of Cato, the almond was not known, but was brought from Greece, under the name of the Grecian nuts; and the Dictator Lucullus, after his victory over Mithridates, brought over the first cherry tree full of fruit, which he carried in the procession of his triumph. It is very much to be doubted whether plums, cherries, and other fruit are unwholesome, except when they are unripe, and that, when ripe, they are the same as any other fruit. Both sweet and bitter almonds are met in commerce—the first being the fruit in its cultivated, and the latter in its wild state. Both produce oil by expression; and by distillation, an essential oil is produced from the bitter almonds, in the use of which considerable caution is necessary, from the quantity of prussic acid which it contains. Of almond oil about 600,000 tons are annually imported from Syria, and the nations bounding on the Mediterranean. The barks are all astringent, and that of the *Prunus Spinosa*, or sloe, the indigenous variety of this country, is a most powerful substitute for

Peruvian bark. Some time since there was great fear that these plants would be entirely destroyed from the vast quantity that was employed by wine-merchants and tea-dealers the last making use of the leaves for cheap southing, and the former employing the fruit for giving astringency to their low-priced Port wine.

#### THE LATE MR. LOUDON.

THE demise of this gentleman, which took place under circumstances which we should have liked to have been reversed, has imposed upon the horticultural world a task which we shall hope to see promptly performed, for the widow and the orphan have been left a mine of gold which the lovers of a garden ought to work. The following statement appears in the *Gardeners' Magazine* :—

The *Arboretum Britannicum* was got up between the years 1833 and 1838, and published on Mr. Loudon's own account at an expense of upwards of 10,000*l.* The greater part of this sum was owing at the completion of the work ; but it sold so well, till the late depression of the book trade in 1841, that only about 2,600*l.* of the debt remained to be paid off at the end of that year. It is, however, necessary to observe, that this large proportion of the debt was not paid off solely by the produce of the *Arboretum*, but in part by the profits of Mr. Loudon's other literary property, consisting of thirteen different publications, all of which stand pledged in the hands of his publishers, Messrs. Longman, for the debt on the *Arboretum*. This debt, at the present time, amounts to about 2,400*l.* ; and hence, if 350 additional subscribers could be got, the debt would be at once liquidated, the works pledged for it set free, and Mr. Loudon or his family would enjoy the whole of his literary property.

This appeal would never have been made had not Mr. Loudon, who has been an invalid for several years, been lately seized with an inflammation of the lungs, terminating in chronic bronchitis, which, even if the disease should be considerably alleviated, will effectually prevent him from any longer pursuing his profession of landscape-gardener, on the produce of which profession, and on the literary labours of Mrs. Loudon, he has entirely depended for his income, since his literary property was pledged for the *Arboretum*. Under these circumstances, Mr. Loudon feels himself justified in taking this mode of soliciting additional subscribers to the *Arboretum*, and in begging his friends and patrons

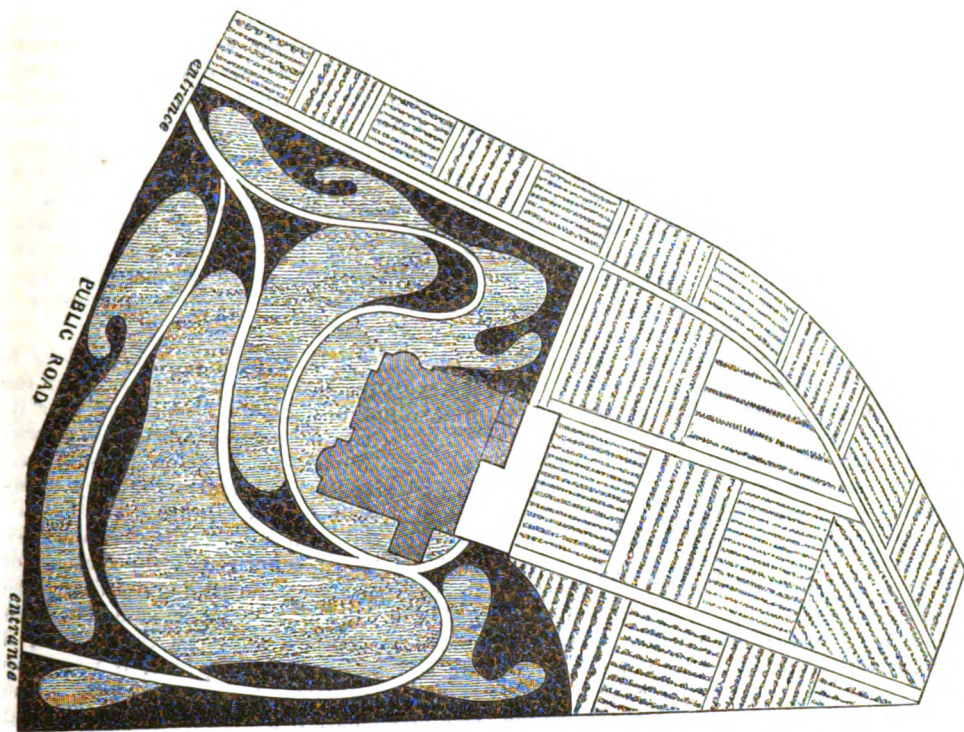
throughout the country to assist him in obtaining them.

The *Arboretum* has been spoken of in the highest terms in all the principal Reviews of Europe, and in the Botanical Periodicals of North America. The *Quarterly Review* says :—

"This book is one solid value, worthy of a place in the library of every landed gentleman, as well as of every student of botanical, arboricultural, and horticultural science, &c.

If, then, the *Arboretum* is "worthy of a place in the library of every landed gentleman," it may be permitted to its author, under his particular circumstances, to direct the attention of landed gentlemen to the book. Surely there must be more than 350 hereditary libraries that do not yet contain the work ; not to mention the libraries which some gentlemen devote to their gardeners, foresters, and bailiffs, in which the *Arboretum* will be found a most useful acquisition.

Ere a month elapses after the appearance of this statement, the author is "gathered to his fathers," and Mrs. Loudon, and we believe one child, are left dependent on the vast literary stores, which without some active measure of justice and sympathy, can avail nothing. As a correspondent of one of the Garden Newspapers observes, we ought not to think of Mr. Loudon alone, however we may honour his memory as one of the most active and industrious of men. A vast debt of kindly feeling is due to Mrs. Loudon ; the departed is commemorated in his works, and they endure ; but his surviving partner has, it appears (and many know the fact), been for many years a help-mate in every, the best, sense of the word, to her late husband. Let her, then, be above all, the object of public esteem. We would suggest that every gentleman, the proprietor of an extensive gardening establishment, should purchase a copy of the *Arboretum* for his library ; and another copy of his great sterling books of reference, the *Encyclopædias of Gardening and of Plants*, for the use his gardener. Also, that every agricultural association purchase a copy of the *Encyclopædia of Agriculture*. And finally, that some influential member of each leading subscription library throughout the kingdoms propose a copy of the *Arboretum et Fruticetum*. We have lately witnessed the great effects resulting from appeals made in behalf of the writers of novels, tales and tragedies ; may we not hope, for the honour of the national character, that an appeal, somewhat of the nature of the one now made through the organ of the *Gardeners' Gazette*, may avail in the cause of science, and of the survivors of one of its ablest advocates.



## LAYING OUT GARDENS.

UPON the best method of doing this scarcely any two agree, and in many of the best writings upon the subject, there seems an absence of all principle. But, it should be recollected, that in forming gardens the same piece of ground may be laid out a score different ways, and all be equally good—that is to say, each may have as many admirers as the others, nor does it follow that because one scientific man likes one better than the rest, that it is really better, any more than when a man chooses a carpet before fifty others laid at his feet, it shall, in reality, be better than the rest. There are certain rules laid down by certain people whose taste has no more claim to govern that of the present day than the fashions in the days of Elizabeth have the fashion of Queen Victoria's. No one could go into the Horticultural Gardens at Chiswick without seeing much to condemn; but so it may be in all public gardens. We have heard those in the Regent's Park repudiated altogether, but no one can deny there are many ingenious and effective bits of scenery, nor is it fair to condemn a recently made garden at all, for the landscape gardener goes into futurity when considering effects. He does not expect with

a sapling to represent the mature oak—he calculates on the ultimate effect, and a few, a very few years, may, and indeed must, greatly alter appearances; nor is it very easy for any but the mind that lays down the plan to bring to bear all the probable work of time. In small concerns we recommend an attempt at immediate effect, and, where money is no object, a lavish appropriation of shrubs. It would be no argument against our notions to say in three years every shrub would be choked or distorted through being planted so thick, because we should say, then is the time to remove some, change some, or do as you please. There is as much delight in changing the places of a few shrubs in a garden, as there is in altering the furniture or fittings of a room. We do not say that the main features of a well laid out ground are to be changed, but that when two plants are in the space that one ought to occupy, take one away, and, if necessary, remove the other a little, to better occupy the space, and complete the plan. The best practice in the world for an amateur landscape gardener, is to take the ground plans of places as they are, and with their accidental forms, lay out the space in a dozen

different ways. We, for instance, have had supplied to us the ground plan, or rather an outline of the ground plan, of a very moderate space, on which a correspondent has built a house, and is now about to lay out the ground. We have sketched out what appears to us to be one of the best plans for concealing the real extent, and making the best of all the points in its favour. The house is not where we should have placed it, but being there, we must make the best of it. The first consideration with us was to appropriate as much as was necessary to a kitchen garden, and especially to secure all the valuable south wall for fruit. The next was so to shape the part to be appropriated to dressed ground, as to give an appearance of greater space than we possessed. There were several points to keep in view—first, making the approach to the house pretty and effective second, to look well to the effect of those portions within the range of two bow windows in the principal apartments. It will be seen on a reference to the plan annexed, that we have adopted a favourite feature, one which makes the entire space look more like a small portion of a large whole, than the entire space of a small one. We allude to the apparent openings in the shrubs, which might, for all the spectator knows, reach a mile, but which, in fact, do not reach half a dozen yards, but merely present a nook for a statue, a seat, or an arbour. Again, it will be seen that the clumps are in the most effective places for concealing the entrances from the house, and the house from the entrances, while some ranging along the road, and occasionally on each side of it, make highly effective breaks in the scene as we approach the house. Then the kitchen garden, although reaching a good way round the premises, adjoins the offices, stables, and road, and is at the back of the house. The entire space of lawn, which is only broken by plantations, may remain as we have placed it, or may be judiciously ornamented with specimens so as not to curtail its apparent extent nor break too much the general features of the plan. The execution of this plan would not be difficult nor expensive, the turf is perhaps the most considerable item, but it may be that there is time to let grass seeds be sown, and if so the only cost will be labour and shrubs. We should first recommend the ground to be thoroughly drained, this is essential to the Kitchen garden as well as the lawn and shrubbery, for every thing will succeed better for it. We presume the ground is something near level, but whether level or on a general slope is immaterial, the first thing after

draining will be to cut off all the turf, if it be good, and roll it up for use, then trench the ground all over, levelling all small hills and holes, so that the surface shall be even, (not flat, for the whole concern may be the side of a hill, for all we know, but even,) so as to have no lumps nor hollows. This done, the road has first to be marked out with stakes; the best for showing and comfort of using, would be laths, two feet long is enough, so that a bundle of four feet laths will go a long way. This portion of the work is the principal, and some can do it with their eye alone better than others can by measurement.

We should by no means bind ourselves to the exact form laid down on paper, but the general outline should be something near it. When the road is pegged out something near the mark, we should lay down slips of turf on each side the road, and correct any apparent sharpness or ugly turn, which will sometimes appear, and see that the sweep is easy and effective. Then comes the making of the road, which should be dug out from nine inches to one foot deep at the side, and from twelve to eighteen inches in the middle, if the soil be good so deep; or, if you have plenty of rubbish, it may be deeper. The soil taken out, if good loam, will be found valuable, and should be carted to some part of the kitchen garden and laid in a heap. The road must be filled up with brick rubbish, stones, clinkers, or any rough coarse stuff that can be got, or gravel, and nicely levelled. Whatever be in the bottom, the top should be gravel, and as it is wheeled on the place the gardener should walk backwards, drawing, as he goes on, all the largest to the bottom, and keeping the finest on the top. With regard to the clumps, whether they are going on simultaneously with the road, or are left till it is done, they must be pegged in the same way. The turf put round them to complete their outline, and the planting, may be done at once. In the clumps or borders which are round the outer extent of the shrubbery, the plants should be got as tall as they will well move, and should consist of firs (of sorts), hollies, acuba japonica, arbor vitæ, laurels, bays, Portugal laurels, box, cedars, &c. to form a sort of bank tolerably close; among these, and quite behind, as standards, there should be thorns (of sorts), almond, double-flowing cherry, laburnum, acasia, lilac, roses, and other flowering deciduous trees; but the dependence must be on the evergreens for the bulk, that in the depth of winter there shall be no great difference in the appearance. In front of these the lowest shrubs should be pyrus

japonica, laurustinus, azalea, rhododendron, rhodora, daphne, andromeda floribunda, roses, and other dwarf-flowering shrubs. The border should be six feet wide in the narrowest part, and should be marked out with turf, as in the other clumps. Those clumps near the entrance, must have the same description of shrubs, the tallest in the centre, and the shorter ones on the sides and ends, and by the disposition of the other clumps it can be easily seen whether they are for a blind or for ornament. The clumps on the side of the road, according as they approach the house, should be planted with more choice things, such as magnolias, of various kinds, American plants, hybrid rhododendrons, and azaleas, andromeda floribunda, and arborea berberis, garrya elliptica, arbutus, ribes, evergreen oak, &c., all of which sorts may form the foremost objects round the borders also, and any slow growing handsome shrub.

The closely planted shrubs must in no case be brought nearer than from eighteen inches to two feet of the edge, and only dwarf ones must be near the front here and there, because there will be spaces required for flowers. The great aim of all planting should be to imitate nature in her most beautiful garb, and to improve upon nature in the only thing which is left us to improve—the grouping of different foliages and flowers which nature never has brought together. A glance at our plan will give some idea of the great effect of a garden so planted and planned. We are not quite sure that we should not make one or two more clumps between the house and one of the entrances in almost a direct line with the window. Indeed, we think it likely enough that we should make one or two more additions, but they would not affect the general outline, for they would be merely to make the scene a little more full. We have now only to finish the turf, which, if there was sufficient taken up, may always be laid down again directly the borders, roads, and clumps, are marked, but if it have to be sown, the turfs round all these must be lowered to the surface, the ground raked even, and grass seed sown, according to the soil and locality; but in a general way, the nurseries in the neighbourhood will be the best judges of what you require. About twelve or thirteen pecks to the acre will be wanted. A reference, however, to page 206 in our second volume will give further information as to the most appropriate mixture. We have gone a little out of our way this time to give an example of making the best of a garden as we find it. In our last we were upon the subject of choosing the site of a garden, and to this

we shall return hereafter; in the mean time our correspondent will see that where we can give a practical lesson upon some affair as it stands, we turn out of the ordinary course. It is not necessary to follow our directions. It may be that the ground is already grass, and good enough, or may be made good enough, for our correspondent's purpose, in which case he will cut out his roads and clumps, and plant his shrubs, perhaps, without incurring any cost for turf, but in whatever way it is done, he will find the kitchen garden and wall most valuable if laid out as we have marked it; and for the remainder, if he gain any hint by our paper and plan, we shall be glad to have contributed our mite. We shall prefer at all times to give plans for real pieces of ground—first, because it will be more useful to know how to appropriate what we have, than to know how to lay out that which we have not, and are not likely to obtain.

#### THE FLORAL YEAR, 1843.

WE have already treated of auriculas, polyantheses, tulips, and hyacinths; we now come to the pansy, a flower which is easily grown in the smallest gardens where there is good air, and which requires but small means when the plants are once procured. If there were any real encouragement to the pansy, such as we should propose to give, we should look for a score or two of stands, but at the leading exhibitions least encouragement is given, but few stands are shown, and those but middling. We have not this year seen one good stand at any public exhibition, and of seedlings worth saving, only one Cook's *Dulcifer*. There have been a few, out of hundreds that we have had sent us, that will be acquisitions, but the flower is declining in some places, and will in all, unless something better be done, for want of encouragement. The most successful amateur exhibitors, that is to say, deservedly successful, have been, Mr. Edmonds of the Wandsworth Road, Mr. Downton and Mr. Bridges of Hampton. But this superiority is nothing to boast of as compared with the same individuals' productions of former seasons. The pansy is like most florists' flowers, treacherous. The variety that would be accepted as a first class flower at one time, would at another time be rejected altogether, because one fatal fault—the notch in the under petal—is frequently found in varieties to which it does not belong, from the simple accident of a check by frost or cold, coming at the period when that portion of the flower first protrudes from the calyx. The check

catches that part only, because it is the only portion unprotected; the rest of the flower grows, that spot does not grow, and the indenture is condemnatory. It is a common notion among florists, that flowers which appear occasionally all through hard weather, and which nothing appears to kill, will stand any thing, but a flower suffers greatly without being killed, and a very slight frost at a particular period of growth will spoil the beauty to a connoisseur, although not to the ordinary observer. Now, it is as essential to the pansy to be protected against wind, and very hot sun, as it is to the tulip, the auricula, and the ranunculus, and a little attention on these points will of itself reconcile amateurs to a more general cultivation of the pansy, but nothing would conduce so much to its advancement as a more careful censorship of new varieties, and more prizes for stands. We have already, in former articles, shown how fatally a small number of prizes operate against public exhibitions; we have mentioned three amateurs who can always insure the first two or three prizes in a show of the kind. What encouragement, then, does a show hold out when there are but two or three? None at all; those who cannot show as well, know it is no use trying to win, and, therefore, unless it is for the sake of getting early into the gardens or show rooms, nobody else cares about putting up a stand. The past year, then, has done nothing for pansies, and to give the flower any thing of a lift, there must be a show where a greater number of prizes shall open a prospect to those who think there is no chance under the present system, but who, when encouraged by the hopes of a prize of some kind, may go to work with such earnestness, as to walk by the very people who now carry all before them with only middling flowers; for a good choice in the sorts cultivated will assuredly make some of the present successful growers look about them.

We come now to a flower which we are very sorry to see going rapidly backwards all round London,—the ranunculus; many a grower has given them up altogether, many others grow, but will not exhibit; there is, in fact, the same bar, the same discouragement, to that as there is to many other florists' flowers. The prizes offered are so few, that Alexander of Kingsland, Tyso of Wallingford, or Lightbody of Falkirk, could always prevent any other from winning. It is against the interests of the dealers to limit the prizes; no amateur cares to spoil his bed, if he have one, for the remote chance of the absence of others (and nothing else affords a ray of hope), and those who have

none, however much they may like the flower, will hardly care to buy show flowers, because there is no chance of shining; on this account, the only shows which succeed at all are those upon the principle of the Spitalfields or Bethnal Green societies, where the members pay monthly to get a fund together, have a show and dinner on the same day, apportion their fund into half a dozen or more prizes, and produce the stands upon the table after dinner. The great shows have done nothing for florists' flowers, for the only apparent exceptions are geraniums and roses, and these are not real exceptions. Many years since there were five great rose growers, and there are no more now. Rivers, Lane, Hooker, Paul, and Wood & Son—and what are all the shows but selections from these five stocks, sometimes one, sometimes more, and occasionally all. Then among amateurs we have just the same persons sweeping away the prize or two which the societies vouchsafe to give; no encouragement for new ones, because the trial is hopeless. Geraniums are even worse among dealers. Catleugh of Chelsea and Gains of Battersea alternately take the two prizes allowed, and all the blaze of flower which is so much admired is produced by those two persons. It would take any other dealer a considerable time to beat them, and as there is no third prize worth having, there is no encouragement for a dealer to try, unless he could beat them at once. Among amateurs there is more of a struggle—thanks to the Royal Botanical society—they are doing some good, and are illustrating the truths of these present remarks by increasing the number of prizes in some things, which are improving, and will continue to improve, if they will but obtain independent judges, and we will give them a hint in time upon the subject that shall save them from a world of annoyance, and give exhibitors unbounded confidence. However, to our subject which we have left in a bad state, and must assist, if possible. The ranunculus, as we said before this digression, is retrograding, as many other subjects are, because there is not proper encouragement, and were it not for the societies we have mentioned we should despair of it altogether; such societies, albeit, they are among humble followers of Flora, keep the fancy alive, and proper aid from higher quarters would bring it into repute. The ranunculus is among the most perfect of florists' flowers. There are some which reach as near as possible to the standard of perfection; some, indeed, that could only be improved by additional thickness in the petal. We should like (as the flower may be



had cheap) to see all those who love a flower commence growing them. Let them turn back to our articles in the *GARDENER* for instructions how to manage them. Let them get a few each of about twenty-four show flowers, and then, if there be any encouragement at all, they may hope to show twelve respectably. Let them be prepared for now, and planted Valentine's day, and we may see the fruits of their enterprise at some of the public shows. For the present we have done.

#### THE FLORIST.

IF any one should recollect to have read the tale or caricature of "The Horticulturist," in the French work, the title of which in English would be "The French described by themselves," he may, perchance, recognise enough in the following to pass for a seedling variety of the same genus; but we have so altered it by cultivation, particularly pruning, that he will almost take it for an entirely new piece. It is curious, but characteristic of the extravagance and the knavery which too frequently blot the circulation of the science:—

We must not suppose that the intensity and violence of a passion can be measured by the insignificance of the object which inspires it. Florists, for instance, though devoted to the most innocent of all pursuits, and apparently without any cause for over-excitement, are sometimes found, like the bee which rests among their flowers, to possess a dangerous sting. Gentle passions, in order to be sure of protection, surround themselves with fierceness and intensity, just as a precious plant is hedged in with briars and thorns, to preserve it from the tooth of cattle.

It may be remembered that, some thirty years ago, the mania for tulips was exceedingly great all over Europe, particularly in France, and still more in Holland. A root, the *Semper Augustus*, was sold for 12,000 francs; a *Yellow Crown*, for 1123 francs and a chariot drawn by two handsome bays; a very middling tulip, the *Viceroy*, was sold for the following objects—four barrels of flour, eight of rye, four cows, eight pigs, twelve sheep, two casks of wine, four of beer, two of butter, a thousand pounds weight of cheese, a bed with all its appurtenances, a bundle of wearing apparel, and a silver cup. At this period there might be seen in the public prints, under the head of foreign intelligence, such a paragraph as this—"AMSTERDAM.—Admiral Liefkens has flowered perfectly at M. Berghem's."

But we must not forget the story. One

day it was discovered that tulips with a yellow ground were no longer beautiful, and that the admiration lavished on them for some time had been bestowed on them most wrongfully; that the only tulips worth cultivating were those with a white ground; that every yellow tulip ought to be rejected from every flower bed that had any respect for itself, and that their seed ought to be cursed and cast to the winds. The amateurs divided themselves into parties: letters, pamphlets, squibs, songs, nay, large volumes, were written on the subject. The amateurs of yellow tulips were treated as pig-headed creatures; beings enveloped in the swathing-clothes of prejudice; illiberal, retrograding, awkward persons—enemies of enlightenment,—nothing better than Jesuits.

On the other hand, the partisans of white tulips were branded as innovators, revolutionists, democrats, disturbers of the public peace, *sans-culottes*, mere youngsters.

Friends quarrelled, spouses were opposed, families were disunited. One evening that M. Muller was playing at dominoes with one of his earliest friends, an old school-fellow, and a renowned horticulturist, like himself, the conversation turned on tulips—tulips yellow and tulips white. M. Muller stood up for the yellow; his friend was a partisan of the white. Both gentlemen were men of good taste and knowledge of life, and always used the greatest moderation in their language, and avoided with great care coming to a discussion.

"Certainly," said M. Muller, "nature has done nothing in vain: there is not a single gem in her jewel-case which does not charm the sight: it is melancholy to see persons act on the principle of exclusion. I freely admit that there are certain tulips with white ground that I would willingly admit into my collection if my garden was more extensive."

"I, also," remarked his friend, desirous of not remaining behind in politeness and concession, "I am ready to allow that the *Erymanthus* (1), yellow though it be, is a flower altogether presentable."

"I should not despise the *Unique de Delphos* (2), notwithstanding its white ground," remarked M. Muller.

"It is not very white," retorted his friend. "Not more than three or four days elapse before it frees itself from a yellowish tint which it has on opening its petals: in consequence we think but little of it."

"It is, however, the one of your collection that I should prefer."

The two friends were on excellent terms, when Madame Muller quitted the room to get

tea ready. It is difficult to tell exactly by what imperceptible transitions they departed from that condition to bitterness, to abuse, to insult; but so it is, that when Madame Muller returned to the room five minutes after, she found them under the table, holding each other by the hair, and cuffing away with all their might. M. Muller had thrown the dominoes in his friend's face, and thus the quarrel began. It may be guessed what sensations of shame seized on the two antagonists when the first effervescence had subsided. The next morning M. Muller sat down and wrote to his friend:—

"I am a wild beast and an ill-bred man; receive my apology. Our old friendship will wipe out this moment of madness. My wife requests the pleasure of your company to dinner to-day. We shall have some of those Brussels sprouts you are so fond of.—  
Your friend, MULLER.

"P.S. — You will oblige me, my dear friend, to put aside for me a few of your beautiful white tulips, for which I have reserved for next season one of my best squares.

He immediately received the following reply:—

"I shall be with you at a quarter before five. You will permit me, my excellent friend, to introduce to you a horticulturist who is desirous of admiring your magnificent tulips."

Through a refinement of politeness, that both understood, M. Muller made a point of admiring the whitest of the white tulips, and his friend was not less polite with respect to the yellow. However, this movement of generosity on the part of M. Muller could not always maintain itself at the same elevation. The ground in which the white tulips were placed was neither dug, nor manured, nor sifted, like that destined for those with yellow grounds. The second year, M. Muller took it into his head that they encumbered the ground; the third year they were placed under a gutter; and M. Muller, after having exhibited his yellow tulips in all their brilliancy, used to say to his visitors, "there are some of the finest of the white tulips. They have been given me by my friend, Walter, and I prize them infinitely;" and when, ten minutes after, he added, "I cannot comprehend that any one can cultivate white tulips," every one was naturally of his opinion.

Only four roses were known in the time of Louis XIV. In the present day, modest horticulturists—those who do not give four or five different names to the same rose, and who do not suffer themselves to be blinded by the

love of novelty and the vanity of discoveries—count forty species, and more than 1800 varieties.

In general, amateurs do not admit every body into their gardens; they have a particular horror of certain descriptions of persons, whom they call flower clippers and stealers. Bribery, wall-scaling, false keys, abuse of confidence, have nothing in them to deter certain persons, when intent on procuring a graft, or a bud of a rose tree, which they possess not themselves. In 1828, the Duchess of Berry obtained, from the rose plantations which she made every season at Rosni, twelve flowers, which appeared to her of remarkable beauty. However, as the point was not only to have beautiful roses, but new and unknown ones, she ordered Madam de Larochejacquelin to show them to a celebrated gardener. The gardener, after having examined them for about ten minutes, declared that three of them were NEW. One of them, in particular, appeared to merit a preference over its two rivals, and it received the appellation of the *Hybrid of Rosni*.

Two years after, in the month of May, 1830, the last season that the Duchess of Berry was destined to see her roses in flower, she bethought herself that she had for two years enjoyed the pleasure of possessing alone the *Hybrid of Rosni*, and that it was time to renew her pleasure, by making others partake of it. She considered that it would be a present of value to the celebrated gardener, and she commissioned Madam de Larochejacquelin to offer it to him for her.

Madam de Larochejacquelin found the horticulturist reading under the shade of two lofty rose trees, bending down with magnificent flowers. He received the offer with all the marks of gratitude which this honourable and delicate attention deserved. But the benefit arrived too late; he had contrived during the short time the roses were in his hands, two years before, to cut off privately two buds of the finest variety: he had grafted them with the greatest success, and he had received the messenger of the Duchess under the shade of two Hybrids of Rosni, far finer than any of those in the possession of Madame.

We fear some of our English florists would be found to be "tarred with the same brush."

#### GARDENERS AND THEIR EMPLOYERS.

THE interests of the employer cannot be promoted without the benefit becoming reciprocal; and the interest of the gardener cannot be permanently improved without the master participating in the advantage. We have, it



is true, protested against a low rate of wages. This, at the first blush, would appear a sort of attack upon the pockets of the master, but a moment's consideration will place the matter in a different light. The Gardener has to work with the head as well as the hands. He is, or should be, master of a science constantly advancing—a science in which he improves daily, if he have the opportunity and the motive to attempt it. Now, we maintain, that a man who has sufficient to live upon and keep his family, in his humble sphere—for humble enough it is in all cases—may pursue his business and improve his practice every week of his life. But he who has to encounter privation, whose mind is not at ease, who finds at home claims which he is not able to answer, cannot apply equally well to his business, and he is not of the same value. He follows his occupation as a duty, which he fulfils only so far as he is obliged; which he attends only the hours necessary for insuring his pay; which he commences without pleasure, and leaves without reluctance. It is to render men worth more, that we would give them more; for we maintain that the master will have more work done in proportion to the money he pays, if his gardeners have liberal wages, than he will receive from men placed on the footing of labourers.

It would be well if those who endeavour most illiberally to set the labourers limit on the wages of gardeners in public establishments, were doomed to live upon the scanty allowance a few months; and the more these people were inclined to improve themselves, the more they would feel the privation of books, of papers, and of the means of improvement. By the time they had been kept on twelve shillings per week a couple of months, they would appreciate the value of an additional sixpence per day, and we should no longer have the stamp of inferiority to bricklayers' labourers, to dustmen, to the lowest dregs of the populace, placed upon the profession of a gardener. They would begin to think how unjust it is for a public establishment, to which all classes look for example, to make that example permanently injurious to a large and valuable class, who have a right to their rank in the scientific world, and whose only degradation is inflicted by the heads of their own profession. It may be argued that a vast majority of those employed in a garden are labourers; so much the worse; the employment of labourers as gardeners is one of the worst evils that gardeners have to encounter; it is an attack on a gardener's only property—his profession; a profession which has cost him many sacrifices, and sometimes considerable money; it is taking

from the profession the only return they can ever look for—employment, and throwing it to people who never knew a trade, never sought a profession, never sacrificed anything to their training, and who, in a moral sense, have no right to it. But a tenfold injury to master and gardener arises out of this. The system of employing labourers is full of mischief; first, it introduces a careless, slovenly mode of gardening; for men who do not learn their profession by means of proper instruction under good teachers, never acquire proficiency, and seldom become tolerable in a garden of any pretension to neatness. Secondly, it confounds in a few years the labourer with the gardener, and lowers the character of the profession altogether. Thirdly, it leads to low pay and great distress among the very masters of the business. Fourthly, it doubles and trebles the number of people seeking employment in a garden, and every labourer employed throws a gardener out of bread. Lastly, a man has to pay ten persons to do the work that seven or eight proper gardeners would do infinitely better. We shall return to this subject; but we cannot conclude without congratulating those gentlemen who have already acted upon the plan of employing none but gardeners, and of adding the sixpence per day, which we have so often recommended. It is not less pleasing to ourselves to find that in every instance the total weekly wages have not been more, while the work has been done much better, and the hands employed have been more creditable to those establishments.

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#### GARDENING FOR THE INDEPENDENT AGRICULTURAL LABOURER.

WE return to this subject, because we have heard the few remarks upon the "influence of gardening upon the independent agricultural labourer" condemned. The persons who objected to those remarks were wealthy farmers, and the reason they gave for their doubts upon the subject was this. How can the cottager be furnished with a garden close to his door without trenching upon our best and most convenient pastures, which uniformly lie at the back of his house? The answer is—*this is precisely the sacrifice you are required to make.* The cottager wants half a rood of ground *at home* to employ his mind. The allotment system, though admirable as far as it goes, never will effect the good we are aiming at. The rood, or half of an acre of ground he obtains by that system is universally a half mile or more from his door; and he can only cultivate it by breaking into a whole day, or by working

after sunset. This is not *gardening*—it is spade labour. He is willing enough to perform it, because it secures to him a supply of potatoes for the year; but he does not perform it as a recreation or an amusement for the mind. The great thing to keep any of us well employed is to have something to do close at hand—not to have to go half a mile after a hard day's work to look for it—and if there is a choice, as there always is in a garden, so much the better. But the objection is, that for the great moral and substantial good thus to be achieved, a great price must be paid. Now, it is a very large rural parish which contains one hundred married labourers. By the Parliamentary return of 1831, there is no more than one married agricultural labourer for every sixty acres of land; and half a rood each is quite as much as any one of them requires for a home garden. The price, then, to be paid is, that the farmer who has 480 acres of land should sacrifice *one*; and suppose the population was doubled, and it required two, what is the sacrifice? and that one runs the whole length of the village, in every situation, behind the labourers' houses. And the ground, moreover, only wants taking off at one stripe. The piece deducted will not injure the field at all. It is not like taking a whole field, which has to go the round of the field system, from a farm. It is merely, we repeat, a stripe that is wanted; and more than that, *it should be granted*.

#### HEPATICA.

THIS very beautiful but much neglected subject is one of the earliest of the spring flowers, and when well grown forms the chief ornament in borders and clumps in February and March. One of its characteristics is the appearance of its flowers before the leaves, and the five varieties which are familiar to almost every lover of a garden are thus described by Miller.

The characters are,—the flower has a three-leaved empalement. It hath six petals, which are oval, and expand to the bottom, with a great number of slender stamina shorter than the petals, terminated by obtuse summits; and several germen collected into a head, supporting acuminate styles, crowned by obtuse stigmas. The germen afterward turns to acuminate seeds sitting round the styles.

This genus of plants is by Tournefort, ranged among the Crowfoots, and by Linæus it is placed under Anemone; but as the flowers of Anemone have no empalement, and

the Hepatica hath a three leaved one, it may be separated from that genus; and as it is well known in the gardens by this title, so should we range it with the Anemone, it might occasion confusion. This is ranged in the seventh section of Linæus' thirteenth class, which includes the herbs with flowers having many stamina and styles.

The varieties of this plant are—

1. Hepatica (*Nobilis*) trifolia, cœruleo kore. Clus. The single blue Hepatica, or Noble Liverwort.

2. Hepatica (*Plena*) trifolia cœruleo pleno. Clus. The double blue Hepatica, or Noble Liverwort.

3. Hepatica (*Alba*) trifolia flore alba simplici. Boerh. Ind. The single white Hepatica, or Noble Liverwort.

4. Hepatica (*Vulgaris*) trifolia rubra flore. Clus. Single red Hepatica, or Noble Liverwort.

5. Hepatica (*Rubra*) trifolia flore rubra plena. Boerh. Ind. Double red, or Peach-coloured Hepatica.

There has been some mention of a double white, but we confess we have not seen one, though there can be nothing more likely than the production of double white varieties from seed. It is one of the few subjects which for its beauty is treated with undeserved slight, as indeed are many flowers that merit a better fate. The authority we have quoted says—

These plants are some of the greatest beauties of the spring; the flowers are produced in February and March in great plenty, before the green leaves appear, and make a very beautiful figure in the borders of the pleasure-garden, especially the double sorts, which commonly continue a fortnight longer in flower than the single kinds, and the flowers are much fairer. I have seen the double white kind often mentioned in books, but could never see it growing, though I do not know but such a flower might be obtained from seeds of the single white, or blue kinds. I have sometimes known the double blue sort produce some flowers in autumn, which were inclining to white, and thereby some people have been deceived, who have produced the roots at that season, and planted them in their gardens; but the spring following their flowers were blue, as before; and this is what frequently happens, when the autumn is so mild as to cause them to flower; but whether the double white sort, mentioned in the books, was only this accidental alteration in the colour of the flower, I cannot say, though it seems very probable it was, since I never could hear of any person who ever

saw the double white sort flower in the spring.

The plant is frequently lost by the haste of the grower to propagate it, and when parted into pieces too small, they frequently go off altogether. The single sorts produce seeds yearly, whereby they are easily propagated, and also new flowers may be that way obtained. The best season for sowing of the seeds is in the beginning of August, either in pots or boxes of light earth, which should be placed so as to have only the morning sun until October, when they should be removed into the full sun, to remain during the winter season; but in March, when the young plants will begin to appear, they must be removed again to a shady situation, and in dry weather should be frequently watered, and about the beginning of August they will be fit to be transplanted; at which time you should prepare a border facing the east, of good, fresh loamy earth, into which you should remove the plants, placing them about six inches distance each way, closing the earth pretty fast to their roots, to prevent the worms from drawing them out of the ground, which they are very apt to do at that season; and in the spring following they will begin to show their flowers; but it will be three years before they flower strong, and till then you cannot judge of their goodness; when, if you find any double flowers, or any of a different colour from the common sorts, they should be taken up, and transplanted into the borders of the flower-garden, where they should continue at least two years before they are taken up or parted; for it is remarkable in this plant, that where they are often removed and parted they are very subject to die; whereas, when they are permitted to remain undisturbed for many years they will thrive exceedingly and become very large roots.

The double flowers, which never produce seeds, are propagated by parting their roots, which should be done in March, at the time when they are in flower; but you should be careful not to separate them into very small heads, nor should they be parted oftener than every third or fourth year, if you intend to have them thrive, for the reason before given. They delight in a strong loamy soil and in an eastern position, where they may have only the morning sun, though they will grow in almost any aspect, not too warm, and are never injured by cold.

They should therefore be placed in borders where they are to remain, and we should never attempt to disturb the root. But when it had become larger than necessary for its situation, we should chop it through the middle with a spade and take half away without dis-

turbing the other half, and merely fill up the hole that was made, with fresh soil. The half you take should be on the side it can be best spared from. If it be too forward cut off the front half. If too backward, the back half, and if it be in the way on either side, let the side which obtrudes be taken. The bloom will thus be scarcely interrupted.

#### FORCED PROPAGATION OF DAHLIAS INJURIOUS.

If all nurserymen and florists adopted the same rule and plan of propagation, it might be wise to let out dry roots of a fine dahlia; but when it is known that some people force the root from the very earliest period down to the latest moment, and propagate the straw-like, miserable plants, until people get little more than two leaves and a fibre for their money, and even that too late to form a strong blooming plant the first season, nothing can tend more to deteriorate a good flower than to send out dry roots. If as we have seen, a plant can spend itself in blooming, until it has not strength to give a double flower, how much more must it distress a variety, to be forcing the roots, and taking off tops and sides over and over again, until the plants when sent out, can scarcely be recovered? It is for this reason that, if a man has the least regard for the character of a dahlia, he should propagate it carefully, and send out good strong plants, that the cultivator may have an opportunity of growing it as strong as his older varieties, and of getting good blooms in the height of a season. How many people are there who have had plants of really good varieties too weak to secure a single good flower all the first season; and, as plants of new and good things are usually scarce, they have been glad to get them upon any terms and in any state. Some of the cunning dealers no sooner get in their plants of a new thing, than off they cut the tops, and place both cuttings and plants in a strong heat. This is not all. By the time a cutting has struck, two side-shoots or arms are formed on the decapitated plant, and one of these suffers amputation, to form another plant. This does very well to keep at home: the remaining limb of the old plant has to form an apology for a head; and thus twelve plants may be sent out, and six kept at home, out of half-a-dozen plants originally bought. But the growers obtain their plants worse, and later than they ought, by all the time thus consumed, and all the deterioration thus contrived. Every man should know, however, when a variety is sent out; and if he be not served within a day or two of the time that

other people are served, he may countermand his order, or make up his mind to have a head or a limb, which will require all his cunning to make a good plant in time to give him a bloom. But it is just the same if the whole stock is in one hand, if that one person is too hungry, or the stock is short: the necessity of getting a sufficient number of plants to meet the demand induces a forward propagation and a late delivery, because all the early ones are beheaded, and denuded of an arm, or perhaps two, and still forced on, while there is a single bud to form a shoot. Thus the flower gets condemned the first season for a semi-double flower, while it is, in reality, like a jaded horse, merely out of condition. There are two or three rules which ought to be attended to in sending out plants. First, the grower, to do any good with them, should have them well rooted by the 20th of May. Secondly, they should be plants struck from original shoots of the tuber, and not tops or sides. Thirdly, they should be a week in a cold frame, merely saved from frost, before they are sent out. Nurserymen have a right to do what they like with their own; but all beyond this places the character of a flower in jeopardy. If a florist chooses to run this risk himself, well; but if he lets out dry roots, he is at the mercy of every hungry propagator; and those who buy dry roots are likely to be more anxious than he who possesses a whole stock, because they know all their neighbours are at work at the same thing, and they endeavour to beat them in number: every extra plant, if only as big as a straw, is so much in their pockets; and they watch every bud, every shoot, every leaf, as a cat would a mouse-hole, ready to seize upon the most remote chance of an additional half-guinea. Thus the cultivators of the dahlia have hardly fair play, because they too often pay half-a-guinea for the privilege of forming a dry root for the next season, instead of being enabled to exhibit from a plant the year they buy it. Thus it is, that many a flower which has really fair claims, is often condemned and discarded the first season.

#### MANAGEMENT OF NEWLY PLANTED FRUIT TREES.

OF all the careless things done by careless people, there is scarcely anything more conspicuously bad than taking up fruit trees, shrubs, and plants at nurseries. Walk round with a man, and say nothing to him, mark which trees or plants you want, he will give a couple of digs at the ground and pull up the plant by main strength, cracking and tearing

all the roots at the places where they are most tender and most useful to the tree, and so, force you as it were to cut in the head and lose the growth it has been making. There is some little more care bestowed upon trained trees and not much. Mr. Hayward, who has had a long and not very learned squabble with practical gardeners in one of the weekly papers, has, in his work called *The Science of Horticulture*, given some very pertinent remarks on this subject; he says—

In the removal or transplantation of Trees, gardeners and nurserymen are generally very careless and inattentive in taking them up, and care not how much the roots are broken or lessened in number, provided they have enough left to keep the tree alive: the consequence is, that although the branches left on may remain alive, there is so great a deficiency of sap, from the loss of roots, that the vessels cannot be filled the following spring; therefore they contract and become inflexible, and after one or two seasons are incapable of extension; so that when in course of time the roots are restored, and the sap supplied in the usual quantity, it is, from being restricted in its former course, impelled through the nearest vertical and accommodating buds that offer.

“Hence it will be seen, that in almost all trees trained in the common way, the first branches which were trained in, and are the most horizontal, are the smallest and weakest, and in consequence incapable of bringing fruit to perfection; and as these occupy the best part of the wall, the strongest and most luxuriant shoots, by being trained erect, quickly grow out of bounds, and are annually cut away.

“Thus the strength of the tree is wasted, and the continued efforts of Nature to produce fruit in proportion to the age and capacity of the roots is obstructed, instead of being forwarded and assisted.

“It is this effect that induced the practice of heading back young trees on transplanting; and under such circumstances it is certainly a proper and necessary method.

“Trees that are not headed back, after the usual mode of transplantation, such, for instance, as half-trained and full-trained trees from the nurserymen, are found to throw out their strongest shoots immediately about the stem or trunk; and notwithstanding these are removed, this and every other attempt to force the sap into the old branches is vain,—its nature will remain the same; and a vigorous head cannot be restored, but by a removal of the old branches.

“This shows the impropriety of the com-

mon practice of heading back and training trees in the nursery ground.

"As it is a general custom for those who plant fruit trees to rely on the nurseryman for the production of their plants, it becomes an object of the greatest importance to inquire how far their general practice is adapted to public utility. And I feel no hesitation in stating, that this business is conducted upon such imperfect principles, that it is almost impossible to find one plant in twenty that is worth transplanting.

"It is obvious, that unless the original plan or foundation be good, a perfect superstructure cannot be raised.

"From the deformity and disorder produced in the nursery ground, almost all our gardens and orchards exhibit in their trees a complete contrast to the beautiful simplicity and bountiful produce provided for by Nature.

"Before, therefore, any thing like perfection can be attained by the gardener, a reformation must take place in the practice of the nurserymen.

"The first operations of the nurseryman I will consider to be transplanting his stocks for engrafting and budding; and in performing this, his only object is, that they grow and produce some kindly luxuriant branches; but as to how or where, or in what manner, either these or the roots may grow, he is perfectly indifferent.

"Whether the bud or graft produces one or more shoots it matters not; the whole are cut off short, or, as it is termed, headed back, the following winter; and such as accidentally produce four or five branches, so placed as to be fastened, to form a flat side, are fixed to stakes or a wall, in the form they are usually trained; and as if further to insure premature old age, decrepitude, and deformity, they are afterwards several times taken up, and transplanted in the same careless manner.

"The roots are broken or cut off at random, and generally either diminished more than one half, or they are doubled back and distorted, and if there be enough left to keep the plant alive, it is thought quite sufficient; and by these means the appearance of blossoms and fruit being prematurely produced, those stunted and deformed plants are sold as half, or full-trained trees, for four times the price of others; and when sold, they are again taken up, and the roots treated and diminished in the same careless manner.

"Miller, Forsyth, Knight, and others, uniformly direct that trees from the nursery ground be cut down, or headed back, to two or three eyes, the next spring after planting;

and with such plants as are here described, there cannot be a better mode of treatment, but this is evidently losing time, and wasting its produce.

"Whenever the roots of a tree are diminished on transplantation, the supply of sap must be proportionally lessened; for if the branches of a tree, under such circumstances, are left at full length, the sap-vessels, for want of a due quantity to distend them, become bark-bound and inflexible; and when the roots are restored, and furnish a luxuriant quantity of sap, this, from being obstructed in its former channels, forms new ones through the buds that offer the most perpendicular position next the stem or trunk; and although these shoots may be rubbed off, still they form again in the same place, and it will be in vain to attempt supporting the original branches.

"A regular head cannot be formed, but by a removal of the entire old one; and frequently the vessels of the trunk itself become so fixed and stubborn in the bark, and particularly in standards, as to force the sap out into luxuriant branches near the root.

"It has often been made a question, and a subject for argument, whether it is better to transplant from a rich to a poor soil, or the reverse; but as the transplanting from a rich to a poor soil, even were the roots entire, must cause the bark or sap-vessels to contract, for want of the usual supply of food, and be productive of the same consequences as curtailing the root, the doubt is easily solved.

"It may further be remarked, that however diminutive a plant may be from poverty, provided the vessels have always been free from contraction, they will readily expand through all the usual channels, and receive and regularly dispose of every additional supply of sap, however great it may be."

The most extraordinary fact is, that however much we may write, however much our predecessors may have written on these palpable negligences, little is done towards lessening the evil, and even those who are most interested rarely trouble themselves about the most important of all considerations in the removal of trees—the way in which they are taken up.

#### PLANTS, PRACTICE, AND PERIODICALS.

*Being the spirit of the entire Horticultural Press, abridged, and with original Notes.*

**FOREST TREES.**—The system of Doctor Thackray for the management of timber is again brought forward. His system is

to take off all branches that are likely to be in the way while young, and not to let any grow until they are large. By these means he prevents large scars, such as are almost inevitable when great branches are taken off.

**SHRIVELING OF GRAPES.**--Coldness of the soil is said to be the cause of grapes shriveling. An instance is related of grapes shriveling on vines after the frost of 1837-8, and as it was supposed to arise from the upper roots being frozen, and the lower ones striking into cold soil, they were replanted in 1841 very near the surface, and the grapes were perfect afterwards. The importance of the treatise published recently in the *GARDENER* is somewhat illustrated by this fact. Another case occurs in which a vine border was planted for the first time, with salvias and other plants, which shaded it, and the grapes for the first time shrunk, proving incontestibly the efficacy of another portion of the directions in the treatise alluded to.

**RIPENING GRAPES ON WALLS.**--Mr. Maund's plan of covering grapes with small glazed cases hung upon a nail, already familiar to us from its publication in *Johnson's Almanac*, is mentioned as a novelty. The plan is not novel, for it has been done many years; the only difference being in the form of the glass case.

**HEATH MOULD.**--Some one having recommended a mixture of woody fibre, leaf mould, charcoal, and night soil, as a substitute for peat or heath mould, Mr. Sherwood of Stamford Hill gives an opinion, that a trial of it would be a dangerous experiment.

**COVERINGS FOR FRAMES.**--Transparent waterproof coverings for pits and frames are recommended to be made of a cheap thin calico, covered with a composition, made of three parts of pale old linseed oil, one ounce of sugar of lead, and four ounces of white resin. The sugar of lead to be ground with a small portion of the oil, and then put into the remainder of the oil. The resin to be then added, the whole mixed, gently warmed, and stirred till thoroughly mixed. The material to be covered is to be stretched, and tacked to a frame or to the floor, and the mixture laid on with a large brush. The next day it may be rolled up, or applied to its use as a covering to frames or pits; the best way is to put it on a roller.

**CHRYSANTHEMUMS.**--Casimer is said to be a large crimson flower, and the handsomest of all the tribe; *Campestroni*, a fine flower, but showing a large eye; *Beauty*, a pale lavender blooming late; *Marshal Augereau*, straw colour, flat and full, and of a

peculiar growth (so we should think any flowers that were flat and full); *Achmet Bey*, maroon, tipped with white; *Celestial*, a full white; *Formosum*, fine white; *Golden Lotus*, handsome yellow; *Pulcherrimum*, fine lilac; red flowers, are said to be dull. This is not new; many of these flowers are beaten, but we would sooner take Messrs. Chandler's word for a good selection than any printed authority we know of.

**PRINCE ALBERT PEA** is said to be one week earlier than the early May pea, both having been sown 28th of January, side by side, and one being ready to gather on the 18th and the other the 25th of May.

**STRAWBERRIES FOR FORCING.**--One who signs himself the Knave of Spades lays his pots on their side, and packs them in mould three or four rows high, leaving the plants next the wall not covered, but forms a complete bank of mould, which he beats, to throw off the rain, and in winter throws fern or straw over the whole. Strawberries only require to be kept from the wet and the frost, and we should think there were a hundred ways less troublesome.

**PLANTING SHRUBS.**--A writer in one of the papers recommends planting shrubs after a novel fashion. Lay the roots on the surface, and carry enough soil with you to cover up the roots. That it would do for particular specimens once in a way is likely enough, but the necessary stakes to support the plant for a good sand place would empty a timber yard.

The **PINE-APPLE QUESTION** continues to occupy a large space in the horticultural press. All the squabbling leads to the same conclusion, that some choose to grow small pines, and produce them quickly, others to grow large ones, and get them as soon as they can. Some one, we forget who, makes a wonder of having planted out pines without pots. He might have seen boxes full of pines in fruit, planted in the soil without pots years ago, had he taken the trouble to call at Mr. Wilmot's, at Isleworth. It is any thing but a novelty.

**MILDNESS OF THE SEASON.**--The papers teem with lists of flowers and plants in bloom out of season, but they consist of plants which usually bloom till the frost cuts them off, and not of flowers coming before their time.

**FOUR CROPS OF POTATOES** were grown by John Digby of Buxton on one piece of ground, between March 11 and October 20. The first was taken up in May, the second early in July, the third in August, and the fourth on the 20th of October.

**SCALE ON PINES.**—Fermenting stable dung kills the scale on pines, but it is an old remedy. We saw it used with effect to clean the pines sold at the sale of the Horticultural Society's stock.

**LEYCESTERIA FORMOSA** is said to produce good food for game, and to be a good plant for shrubberies and plantations. The birds, especially pheasants and pea fowl, eat the berries.

**SOUTH LONDON FLORICULTURAL SOCIETY.**—The proceedings of this Society are reported, and a resolution is said to have been passed unanimously, rejecting a cup presented by Mr. Dickson. This report has been contradicted on authority.

**LINNÆAN SOCIETY.**—A communication was read from Mr. E. Tradescant Lay, British Consul, at Amoy, giving some account of a vegetable called *Keih Seen-me*. It appears to be a species of *Alga*, belonging to the genus *Nostoc*. Its chief use in China is in making ragouts. Messrs. Whitley and Osborn exhibited specimens of *Shepherdia argentea* in full fruit, a North American plant, capable of growth in this climate. It produces a red fruit, about the size of a large currant, of an agreeable flavour, perfectly innocuous, and used for making jellies, preserves, &c. A paper was read from Maj. Harris, giving an account of the trees producing myrrh and frankincense, and found in those parts of the coast of the Red Sea and Indian Ocean whence the gums were obtained, in the early history of the world. The myrrh is the production of more than one plant; the best is undoubtedly the production of the shrub bearing the name of *Balsamodendron myrrha*, which is a small shrub. The worst and more liquid kinds of myrrh are the produce of a plant considerably larger than the latter, and of probably a different species. The plants from which the frankincense is obtained grow from the sides of the steep marble rocks, and seem to require a little soil for their growth. The gum may be obtained by bruising the tree during its growth. It is collected by the natives of Abyssinia, and exchanged by them for tobacco, cloth, &c. It has a remarkable bark. The outer layer or epidermis is remarkably thin. The second layer is somewhat thicker, and may be used for the purposes of writing. The third layer of the bark is at least an inch thick. Specimens of the bark were exhibited.

**THE BOTANIST** has just been completed, and it brings with it a source of considerable regret. As one of the most neat and accurate of the embellished works, as the most faithful series of descriptions of the Botanical subjects it describes, and as a selection of the most interesting floral beauties, it has claims

which very few works possess, and we regret very much the announcement that it is not to continue. The five volumes now closed, contain representations and full particulars of the introduction, Botanical, Geographical, and popular descriptions of no less than two hundred and forty subjects, and the public had much rather hear that it was to be continued to two thousand four hundred, than thus to close when every year adds several new beauties to our Flora. Mr. Maund and Professor Henslow have seemed quite at home in the work, and we had much rather have heard of their continuing in the same field, than either wandering further, or contracting the sphere of their usefulness.

**GUARDS AGAINST HARES.**—A writer says he has placed sticks round a plant and wound a piece of cotton twine round them to form a sort of fence, which the hares will not touch, whereas nets used for the same purpose have been eaten through.

**GAS TAR.**—It will be recollected that a writer of some celebrity recommended the very free use of this ingredient to keep off vermin. Sowing it with seed, daubing it on trees, and various other applications. A doleful account of losses occasioned by it appears in the same paper. A person dressed the trees in his orchard three or four feet up from the ground with it. Apple trees began to fail and died altogether, the bark of others rotted, and many suffered severely. This ought to be a caution never to try experiments, so often founded on theory alone, except on a very small scale. The Gas Tar kept away vermin, but it killed the trees. Theory said that it would keep off a plague; but the trial which proved its efficacy in that particular, sacrificed an orchard.

**THE COUL ORLEANS PLUMS** is recommended by the Caledonian Horticultural Society, as an early variety on standard trees. A good market plum of high flavour.

**NORMANDY EARLY WHITE TURNIP** is said on the same authority to be in quality about as good as the early white Dutch.

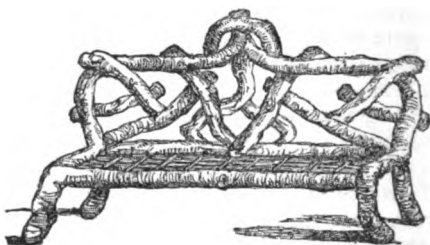
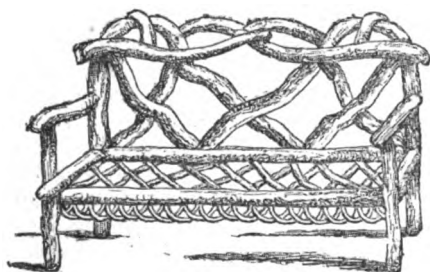
**NEW HARDY OAK, QUERCUS GLABRA**,—introduced in Leydon 1830, and sent from thence to Paris 1836, is considered an acquisition. The leaves are said to remain on three years, in other words, evergreen. Strikes well from cuttings; its wood is heavy and useful, and the fruit eats like chesnuts.

**HYACINTH GLASSES** are said to be affected inside by the roots of the plants, and Mr. Murray thinks that it is the action of carbonic acid gas which operates on silex.

**CHARCOAL.**—The extraordinary value of this article has been long understood among practical men, but it forms a subject for a

good deal of the modern writings. Cucumbers grown in half loam and half charcoal are said to have been fine—no stimulant could have given better fruit. The well known operations of paring and burning have been long known to be advantageous from the charcoal produced. Mr. Rivers has used for roses in pots, turfs, roasted on a sheet of iron for an hour, over a moderate fire, which, of course, makes half of it into charcoal; in short, practice has made the use of charcoal familiar many years, and if our readers want to try it with any thing particular, let them use it as Mr. Barnes, of Brixton, does, on the surface of the compost in his pots.

**MANAGEMENT OF HEATHS.**—Mr. Ayres thinks the best cultivators commit an error by allowing too strong a current of air. His theory is, that the strong winds at the Cape blow from the sea to the land, and are loaded with moisture, therefore, we are wrong in imitating these strong winds with arid air, which he thinks mildew should be attributed to, instead of being, as now, attributed to moist air. Mr. Pince's and M'Nab's treatment of heaths, which is, to give them the benefit even of a gale, if there were one, seems to be so good, and they are both as cultivators so successful, that we should hesitate before we changed the system.



#### RUSTIC SEATS AND ORNAMENTS.

THE examples of rustic seats are not of the lightest or most elegant forms, but are adapted for the nooks or places on the outer borders or boundaries of a premises where there is some hardship to endure. In such seats as these there must be a little ingenuity in the choice and application of the parts, for they are required in some measure to match each other so that the piece of fancy work shall be uniform or at least a little uniform, and in small works of the kind if there be any quantity of material to choose from there is but little difficulty in accomplishing the task, but in larger affairs such as entrances to arbours and alcoves, the fronts of fancy buildings, and some other things where uniformity is a much greater object, and the work has to be somewhat more nice, a lesson may not be amiss. There is never any difficulty in procuring one piece to answer almost any form that can be required

by only running a saw down the middle of it, when two sides, as perfectly matching each other as two peas, are produced, of which the two flat sides are nailed to the frame, leaving the rustic faces to the front. It is thus that windows, doors, and every other kind of opening can be embellished with rustic exterior, and in forming a design there are



for one side of a design, and it is the easiest of all things to provide one to match exactly,

two or three things to be attended to; first, never to have two windows or doors in such situations as to require to be alike, because, although it is easy to find one of some appropriate form to make good sides to a window, it is very difficult to find another to match for a second window of the same kind. Now, it will appear plain enough, that the splitting of the principal front ornaments of any thing whereby a perfect uniformity is secured, saves a vast deal of trouble and labour. Even the back of a seat can be made very much more uniform, if you have only to find one appro-



priate piece, instead of two that are like each other, and you may always contrive that there shall be no lack of strength, because the difficulty of choosing, where you have not to find duplicates, is so greatly lessened, that you may always suit yourself.

#### DEATH OF MR. LOUDON.

(From the *Gardeners' Magazine*.)

THIS will be the last number of the *Gardeners' Magazine*, as its founder and conductor is no more. On the 14th of December, 1843, died, at his house at Bayswater, John Claudius Loudon, Esq., who for nearly half a century has been before the public as a writer of numerous useful and popular works on gardening, agriculture, and architecture.

Mr. Loudon's father was a farmer, residing in the neighbourhood of Edinburgh, where he was very highly respected; but Mr. Loudon was born on April 8th, 1783, at Cambuslang, in Lanarkshire, where his mother's only sister resided, herself the mother of the Rev. Dr. Claudius Buchanan, afterwards celebrated for his philanthropic labours in India. Dr. Buchanan was several years older than Mr. Loudon, but there was a singular coincidence in many points of their history. The two sisters were, in both cases, left widows at an early age, with large families, which were brought up by the exertions of the eldest sons; and both mothers had the happiness of seeing their eldest sons become celebrated. Mr. Loudon was brought up as a landscape gardener, and began to practice in 1803, when he came to England, with numerous letters of introduction to some of the first landed proprietors in the kingdom. He afterwards took a large farm in Oxfordshire, where he resided in 1809. In the years 1813-14-15, he made the tour of Northern Europe, traversing Sweden, Russia, Poland, and Austria; in 1819 he travelled through Italy; and in 1828 through France and Germany.

Mr. Loudon's career as an author began in 1803, when he was only twenty years old, and continued with very little interruption during the space of forty years, being only concluded by his death. The first works he published were the following:—*Observations on laying out Public Squares*, in 1803, and on *Plantations* in 1804; a *Treatise on Hothouses*, in 1805, and on *Country Residences* in 1806, both 4to; *Hints on the Formation of Gardens* in 1812; and three works on *Hothouses* in 1817 and 1818. In 1822 appeared the first edition of the *Encyclopædia of Gardening*, a work remarkable for the immense mass of useful matter which it contained, and for

the then unusual circumstance of a great quantity of woodcuts being mingled with the text. This book obtained an extraordinary sale, and fully established his fame as an author. Soon after was published an anonymous work, written either partly or entirely by Mr. Loudon, called the *Greenhouse Companion*; and shortly afterwards, *Observations on Laying out Farms*, in folio, with his name. In 1824, a second edition of the *Encyclopædia of Gardening* was published, with very great alterations and improvements; and the following year appeared the first edition of the *Encyclopædia of Agriculture*. In 1826, the *Gardeners' Magazine* was commenced, being the first periodical ever devoted exclusively to horticultural subjects. The *Magazine of Natural History*, also the first of its kind, was begun in 1828. Mr. Loudon was now occupied in the preparation of the *Encyclopædia of Plants*, which was published early in 1829, and was speedily followed by the *Hortus Britannicus*. In 1830, a second and nearly rewritten edition of the *Encyclopædia of Agriculture* was published, and this was followed by an entirely rewritten edition of the *Encyclopædia of Gardening*, in 1831; and the *Encyclopædia of Cottage, Farm, and Villa Architecture*, the first he published on his own account, in 1832. This last work was one of the most successful, because it was one of the most useful he ever wrote, and it is likely long to continue a standard book on the subjects of which it treats. Mr. Loudon now began to prepare his great and ruinous work, the *Arboretum Britannicum*, the anxieties attendant on which were, undoubtedly, the primary cause of that decay of constitution, which terminated in his death. This work was not, however, completed till 1838, and in the mean time he began the *Architectural Magazine*, the first periodical devoted exclusively to architecture. The labour he underwent at this time was almost incredible. He had four periodicals, viz., the *Gardeners' Natural History*, and *Architectural Magazines*, and the *Arboretum Britannicum*, which was published in monthly numbers, going on at the same time; and, to produce these at the proper times, he literally worked night and day. Immediately on the conclusion of the *Arboretum Britannicum*, he began the *Suburban Gardener*, which was also published in 1838, as was the *Hortus Lignosus Londinensis*; and in 1839 appeared his edition of *Repton's Landscape Gardening*. In 1840 he accepted the editorship of the *Gardeners' Gazette*, which he retained till November, 1841; and in 1842 he published his *Encyclopædia of Trees and Shrubs*. In the same year he completed his *Suburban Horti-*

culturist, and finally, in 1843, he published his work on *Cemeteries*, the last separate work he ever wrote. In this list, many minor productions of Mr. Loudon's pen have necessarily been omitted; but it may be mentioned, that he contributed to the *Encyclopædia Britannica* and *Brande's Dictionary of Science*; and that he published numerous supplements, from time to time, to his various works.

No man, perhaps, has ever written so much under such adverse circumstances, as Mr. Loudon. Many years ago, when he came first to England (in 1803), he had a severe attack of inflammatory rheumatism, which disabled him for two years, and ended in an ankylosed knee and a contracted left arm. In the year 1820, whilst compiling the *Encyclopædia of Gardening*, he had another severe attack of rheumatism; and the following year, being recommended to go to Brighton to get shampooed in Mahomed's Baths, his right arm was there broken near the shoulder, and it never properly united. Notwithstanding this he continued to write with his right hand till 1825, when his arm was broken a second time, and he was then obliged to have it amputated; but not before a general breaking up of the frame had commenced, and the thumb and two fingers of the left hand had been rendered useless. He afterwards suffered frequently from ill health, till his constitution was finally undermined by the anxiety attending on that most costly and laborious of all his works, the *Arboretum Britannicum*, which has unfortunately not yet paid itself. He died at last of disease of the lungs, after suffering severely about three months; and he retained all the clearness and energy of his mind to the last.

His labours as a landscape-gardener are too numerous to be detailed here, but that which he always considered as the most important, was the laying out of the *Arboretum* so nobly presented by Joseph Strutt, Esq., to the town of Derby.

Never, perhaps, did any man possess more energy and determination than Mr. Loudon; whatever he began he pursued with enthusiasm, and carried out, notwithstanding obstacles that would have discouraged any ordinary person. He was a warm friend, and most kind and affectionate in all his relations of son, husband, father, and brother; and he never hesitated to sacrifice pecuniary considerations to what he considered his duty. That he was always most anxious to promote the welfare of gardeners, the volumes of this Magazine bear ample witness; and he laboured not only to improve their professional knowledge, and to increase their temporal comforts, but to raise their moral and intellectual character.

This announcement places the Gardener in a higher position than it already occupied, and more especially as we shall have the advantage of some of the contributor's assistance. We are not without our regrets at the close of the work, but inasmuch as that and *The Gardener* were both of a miscellaneous and practical character, and should the public favour, we trust this work will not be found less worthy of patronage because without a rival. We are happy to do justice to the late Editor, and sorely disappointed shall we feel if the recent appeal to the wealthy shall be found other than effective.

#### RHUBARB.

ROGERS, one of the best kitchen gardeners among the publishing folk, gives the following as the best sorts of the now universally esteemed vegetable:

1. *Rheum Rhaponticum*—Rhapontic rhubarb.—A native of Asia, introduced and cultivated since 1573. From the date it will be observed to be an old inhabitant of the English garden.

2. *Rheum undulatum*—Waved-leaved, or Chinese Rubarb.—A native of China, and introduced in 1734.

3. *Rheum hybridum*—Hybrid Rhubarb, a mixed variety.—A native of Asia, and cultivated since 1778.

4. *Rheum palmatum*—Spreading, or palmated-leaved Rhubarb.—A native of China and Tartary, and first introduced into this country, according to the *Hortus Kewensis*, in 1763. The roots of this and the undulatum species constitute the drugs sold in our shops under the name of Chinese and Turkey Rhubarb; the other varieties also possess the like medicinal properties.

There have been several attempts made to cultivate the Rhubarb for that purpose, and dry it in a similar method to the Chinese; but from some cause or other, and principally for want of a stock of roots of sufficient age, it has been laid aside. What had been prepared, however, was found equal to that of foreign growth.

5. *Buck's, or Elford Rhubarb*.—This esteemed and valuable variety was raised from some seed of the *Rheum undulatum*, a few years ago, by a Mr. Buck (whose name it now bears), of Elford, near Lichfield, in Staffordshire. It comes very early, and may be forced in various situations, retaining its fine scarlet colour to the last, though it prefers darkness to light; its flavour seems to be more heightened than diminished.

6. *Tobolsk Rhubarb*.—This variety is of late introduction, and is stated to be very su-

perior for all the purposes of forcing. The author has heard it highly extolled by many who have given it a trial; and for delicacy and fine flavour it stands pre-eminent.

7. *Giant Rhubarb*.—This is an excellent and profitable variety, producing leaves of an immense size, and stalks from two to three feet long, which are thick and fleshy, and abound with the fine acid juice: when cooked they are tender and well flavoured. A few of this sort should be grown in every garden, and especially in that of the cottager.

The pontic and the waved varieties, being the most hardy, are proper only for the open air, as neither improves by forcing; hence, a good stock of the Tobolsk and Elford should always be kept up for forcing.

The hybrid variety is said to be the most succulent; and perhaps it might be so in some soils; but the author could never observe any difference between it and the waved leaved.

*Culture*.—There are two methods by which Rhubarb is propagated—from seed and from offsets or slips; the former is the best and principal—the latter is only resorted to at times when the stock of plants is short, or more particularly when they are required for forcing, as, by having good strong slips for that purpose, nearly a whole year will be gained. For making a permanent plantation, slips are by no means recommended, as they never root so well as seedlings.

The soil most suitable for the Rhubarb is a light rich loam, of a sandy nature, neither too dry nor too moist; and where there is a depth of eighteen inches or more in such land, for the roots to run down, so much the better, as the plants will attain a greater size every way.

In raising the Rhubarb from seed, it should be sown about the beginning of April, in a three or four foot bed of light rich soil, the length being according to the quantity of plants required; sow thinly, and afterwards carefully cover with the same sort of mould, about half an inch deep. Should the weather happen at the time to be cold and unfavourable, a slight covering with a mat will be necessary.

One or two seasons having proved unkindly during the author's practice, he had the seed sown on a slight heat, by which means the plants gained a more considerable growth by far than they would have done without it; but the practice, though sometimes adopted, is not much to be recommended.

As soon as the plants are fairly up, they should be thinned out to seven or eight inches distance, and so remain, keeping them clear from weeds during the summer, and until they are finally planted out in autumn, at which

time a piece of rich ground should be selected; and previously to planting, a good coat of well consumed dung, worked in about a spade deep, will tend much to the vigour of the plants.

The plants should be set out in a row or rows, from three to four feet apart, according to the richness of the soil. If planted in the quineaux manner, they will have the advantage of more room and air. No further after-culture is required beyond keeping the ground clear from weeds, and in the autumn or spring giving a dressing of rotten manure, stirring it in as deep as possible with a spade or fork. Rhubarb so planted and treated will continue many years in perfection without decaying.

In taking the stalks for use, first scrape away a little of the earth; then bend down the stalks you wish to remove, and slip it off from the crown without breaking it, and without using a knife. The stalks are fit to gather when the leaves are but half expanded; but a larger produce is obtained by letting them remain till full grown, as is practised by the London market gardeners. When the Rhubarb is propagated by the root, care must be taken to retain a bud on the crown of each offset, together with a small portion of the root itself, with, if possible, some fibres attached to it. These offsets may be taken from roots of three or four years old, without injury to the plant. They may be planted where they are intended to remain, at the same distance and in the same manner as advised for the seedlings; but, as before observed, they seldom succeed so well.

*Artificial Culture*.—For forcing Rhubarb, the following methods will be found to answer the expectations of those who put them in practice. The varieties which stand first on the list for this purpose, are the Tobolsk and early Elford.

For forcing in the open ground large pots will be required to be placed over the roots, and covered with fermented dung. When the plants are fairly up, which will be soon, and they are observed to get too large for the pots, larger pots must be substituted in their room, or large hand glasses, if there be any to spare; they must be well covered with mats every night, and in unfavourable weather. It has been observed, that under such a mode of culture, Rhubarb comes very delicate and fine flavoured, and quite equal to that forced in pots.

In respect of the dung to be used in covering the pots, it may be noticed that it makes but little or no difference whether it has been previously prepared by turning, or procured fresh from the stable, provided it is not suffered to heat too violently, as the internal heat

should be kept to between fifty-five and sixty degrees of Fahrenheit.

Those persons who dislike the trouble, and others who have neither large pots nor dung at command, may be told, that covering the roots of Rhubarb in the open ground with dry mulchy stuff, about six inches thick, will forward the leaves for use nearly a fortnight before those that remain uncovered.

For forcing Rhubarb in pots, plants of one (if strong), two, and three years' old, will be eligible, and also cuttings, after one year's growth.

As soon as the leaves are decayed in autumn, the plants may be taken up and potted in deep pots, allowing for an inch of earth at the bottom, and the same thickness round and over the top of the root. The mould should be light and rich, and after the planting a good soaking of water will be necessary on purpose to fill up any hollowness between the roots; the pots are then to be placed in a vinery, or in any part of a forcing-house, and where no other plants would thrive for want of light and air. When the Rhubarb plants begin to grow, they must be copiously supplied with water, which will cause them to produce stalks for use, early, and in abundance. As it may be, perhaps, difficult to find a really dark place in a forcing house of any description, pots, similar to those used for forcing in the open ground, should be inverted over the pots of Rhubarb, which will certainly exclude both light and air.

After the plants have done producing stalks for culinary use, they may be turned out in a rich piece of ground, when, after a year's growth, they may again be taken up for the purpose first assigned them.

Hot beds, frames, or pits, where a gentle heat can be kept up, will do extremely well for forcing Rhubarb, provided the glasses are kept darkened. Care must be taken that the roots are planted of sufficient depth to allow for the leaves growing and expanding to their full height and size.

The advantages of blanching the stalks of Rhubarb are twofold; namely, the desirable qualities of improved appearance and flavour, and a saving in the quantity of sugar necessary to render them agreeable to the palate, as the leaf stalks when blanched are infinitely less harsh than when growing under the influence of light, in open situations.

The pots for the purpose of blanching sea-kale and Rhubarb (particularly for the latter), have covers to fit close, these being more convenient than taking the larger pots entirely off, though for sea-kale it will be necessary, as they require to be cut close to the ground.

#### WATERING THE DAHLIA.

THERE is no period of the growth of a Dahlia more important than the first six weeks after planting. Most people who ruin them at all do it by watering. We find people planting them in holes, and giving a profusion of water from time to time; there is but one way, however, of properly treating Dahlias, and this should be begun from the first. We are speaking now of people who desire to grow them in perfection. The water should be given like rain, and not more than once a week. The Dahlia should have no hollow near it. The whole surface should be flat, and all watered. In very hot weather the ground is heated and dried, and a profusion of water at the stem of a plant chills it for a time, and is soon absorbed by the surrounding heated soil. Upon this system there is no uniformity of moisture: the plant is in cold mud one half its time, and half baked the other. The whole surface should be soaked; not one drop more should be given close to the Dahlia than is given at the most distant part. Under this treatment the plant never receives a check. One watering in a week given effectively will do nearly as much good as a shower of rain. It is more natural, the roots grow more freely, because the soil is all alike to them; whereas, if they are alternately drowned and baked, they often receive a check from which they never fairly recover. If we are told that where water is scarce or distant this is impracticable, our answer is, *then it is impracticable to do justice to the Dahlia*. In the growth of the plant, and the blooming for show, the advantage of this whole surface watering is doubly felt, because the damp which arises is taken in by the foliage, and the plant is nourished almost as much as it would be by rain, or as it is at later periods with the dews. The principal object of this paper is to impress upon the mind of the grower the propriety of seldom watering, but of watering effectively. If, on turning up the earth, it is found moist within two, three, or four inches down, it is better to wait a short time for the chance of rain, than to tamper with the plants by applications of water at the root only. We know there are many who will say it is impossible to water an acre of Dahlias in the way proposed. Our answer is, then do not water at all. It is very well at first to water each root just to settle the heart about it, but after that better water everywhere else, and not within a foot of the root, than at the root and nowhere else. But, if people cannot or will not water the whole bed in which the Dahlias stand, and will apportion to each a certain quantity of water nightly, which is a very common practice, we recom-

ment that, instead of forming a basin to throw all the water round the stem and upon the bulb, they draw a trench at least a foot from the plant all round it, and put its allowance there, so that the root is not chilled, nor placed as it were on so much mud, but is encouraged to grow large and gain strength; but, we repeat it is far better to water the whole ground very seldom. The following experiments were tried to settle this point, for two years ago it was only an opinion:—

On the 10th of June twelve Dahlias were planted out in a bed four feet wide, and four inches lower than the path, which was two feet wide, very hard, and consisted of road sand, a foot thick. Twelve of the same sorts and strengths were planted in a similar bed, but level with the surface, and in the ordinary way. The surface of the former bed was perfectly even; the latter had hollows round the Dahlias to hold the water. The bed below the paths was watered with a heavy rose water pot, and almost flooded at the planting; the others had what would be termed a large quantity to each plant. The weather was exceedingly hot. In two days the earth round the plants watered separately was dry, and the plants flagged; in the bed watered all over, the plants were not distressed, and the ground, a little under the surface was moist. The eighth day, one lot had been watered four times, besides the planting time, and not without requiring it. On stirring the earth of the other bed, it was moist three inches below the surface. It was watered as before, with a rose, all over, and somewhat profusely: this was repeated at intervals of eight days from the previous watering, or from the last preceding sufficient shower of rain, and the others were watered always every second day, but sometimes they flagged, and required it in one day. The result was, the plants in one case grew half as large again, the flower much larger and continuous, while in the other, they were not so strong nor so fine, and the flowers, sometimes for a week together, were out of condition.

On adding up the labour, it was found that there was time saved by the general watering, instead of the usual mode of watering each plant; and it was found, on taking up the roots, that there was a vast difference in the size.

Last year the season was so wet that there was little opportunity of trying the experiment again, but a collection was treated in the same way, that is, never watering under seven or eight days from the previous watering (whether artificial or rain), and, although probably there was as little necessity for the watering-pot as was ever known, there was a vast difference between a few put out and constantly

watered and the main quantity which had it rarely,—but always effectually when at all.

We have occupied, perhaps, more space than was necessary with a subject that may be thought trivial, but we recommend those who show to try a dozen or so this way. The plan of making the beds lower than the paths is not very important, but we have always recommended it, to save water, which otherwise runs into the paths, and, in a great measure, wastes. Most persons who grow in any quantity, lay out a piece of ground, and plant the Dahlias out, six feet apart, all over it, making no paths whatever. This is quite as effective, but rather more water is required when applied; and the place is not so clean, because the whole requires to be soaked, and there is a good deal of comfort as well as advantage in raised paths, for people can always walk among the flowers dry, even a few minutes after a shower of rain. It is customary for some persons to mulch the Dahlias; there are objections to this, although, with care, it is very effective. First, the litter harbours the vermin, and particularly the earwig; secondly, as the litter keeps the earth moist upon the surface, the roots come actually through the soil, and may be seen at the top on removing the mulching. In case of neglect, so as to dry the surface, the plants receive such a check as to take a considerable time to recover, if they ever entirely do so; but the great objection is the harbour of vermin—slugs, grubs, and earwigs find it their stronghold, and almost defy extirpation. Where it is difficult to water the Dahlias, it will be found advantageous to tread down the surface, or to roll it after the first wet day; it will retard evaporation, and they will not suffer so much from drought.

#### WATERING VEGETABLES, ETC.

THE more anybody studies the system of seldom but effectual, instead of frequent and ineffectual, watering, the more they will be convinced of its advantage in all kinds of plants in the open ground. Everybody admits how much good is done by a shower of rain in hot weather; we can tell them that an artificial shower, if as plentiful, will astonish them. Let it be tried on a piece of Cabbages, Peas, Beans, Lettuces, or any other crop. They may give a pail full of water to a single plant in hot dry weather, and it will want another directly, because the heated earth hastens its absorption and evaporation. Drench the whole piece of ground, and it will want no more for a week. Plants used to such treatment, do much better than those treated in the ordinary way.

## HORTICULTURAL SOCIETY OF LONDON.

REGULATIONS FOR THE INTERNAL ADMINISTRATION  
OF THE GARDEN.

(*Extracted from the Minutes of the Garden Committee.*)

I. THE management of the garden of the Horticultural Society is entrusted by the council to the garden committee, who meet once a month at least; and, during the intervals of their meetings, to the vice-secretary.

2. Under their direction the immediate superintendence is vested in the head gardener and three under gardeners.

3. For this purpose the garden is divided into three distinct departments, each under the separate charge of one of the under gardeners, who are held responsible for the good cultivation of the plants under their care, and have power to determine what modes of cultivation are most proper.

4. These departments are as follows:—

(1). The orchard and kitchen garden department, including the houses for forcing fruit and vegetables, and the ground adjoining.

(2). The hothouse department, including the greenhouses and other houses, pits or glazed buildings now existing, or hereafter to be erected, for the cultivation of tender plants; together with all the grounds enclosed within the walls of what were formerly called "experimental gardens," with the exception of such part as may be occupied by the orchard and kitchen garden department.

(3). The hardy department, consisting of the arboretum, flower garden, and all the cultivated ground not occupied by the two other departments.

5. The packing and distributing seeds, plants, &c., to the Fellows of the Society, is independent of the above departments, and under the immediate and personal superintendence of the head gardener.

6. The men permanently employed in the garden are exclusively received on the recommendation of Fellows of the Society.

7. The only exception to this regulation is in favour of foreigners, of whom no more than two may be employed at the same time.

8. The names and addresses of the candidates for admission are entered in a book, in the order in which their recommendations are received.

9. Notice is then transmitted to the candidate of the points upon which he will have to give satisfactory evidence before he can be received into the garden, which are as follow:—

(1). That he has been employed for at least three years in some good garden.

(2). That he can write and spell respectably.

(3). That he is sufficiently acquainted with arithmetic to be able to keep accounts.

(4). That he is able to measure land and make simple ground plans.

10. In case of a permanent vacancy in any one of the departments, that vacancy is filled up by the first on the list of candidates for admission, who is received upon complying with the above regulations; but, in the case of a vacancy being temporary only, then it is filled up by an extra man, engaged by the under gardener in whose department the vacancy occurs.

11. The men are successively employed in the three several departments, the transfer from one department to another taking place under the following regulations:—

(1). There are two days in each year on which the men are transferred, and no transfers are allowed to take place on other days, such transfer days being February 1 and August 1.

(2). On each transfer day a number of men, not fewer than one half, and as near that number as may be, are removed from one department to some other.

(3). On this occasion each under gardener selects for transfer the seniors in his department, with the privilege of retaining any one or two of them until the next transfer day, provided the men are willing to stay with him.

(4). When all the vacancies and persons to be transferred are declared, the men to be transferred have the right of choosing for themselves to which vacancy they will be appointed, the choice being given to them in the order of their seniority. The term seniority is always understood as applying to the period of employment in each department, and not in the Garden generally. But if more men apply for admission into a department than there are vacancies, in that case the transfer is arranged by consultation with the applicants.

(5). On each transfer-day the Under Gardeners make out and sign returns, declaring what the conduct of each man transferred has been, during the time he was employed under them; for which purpose printed forms are issued.

(6). These returns, together with the general result of the transfer, are laid before the first Garden Committee which may meet after the transfer day. The returns are afterwards filed, and the substance of them is expressed in the certificates granted

to the men under the regulations hereinafter given.

12. Previously to being recommended to a place as gardener, every man must pass an examination in measuring land, making ground plans, geography, the elements of botany, and vegetable physiology.

13. When any person employed in the garden is ready to undergo such an examination, he gives notice in writing to the Vice-Secretary who appoints the time and manner in which the examination is to take place.

14. No person is, however, allowed to proceed to examination until he has passed through every department in the garden; and no examination is held in the months of December, January, February, March, or April, without the special permission of the committee.

15. The result of the examination is recorded in a book kept for the purpose; if it be satisfactory, a certificate to that effect is granted, and the person examined is entitled to be recommended to a place, provided his general conduct is approved of. The standard of qualification is placed very low by the committee, in order to render the system of examination applicable to all capacities; but the examiner has directions to raise it in those cases in which men desire it, and the certificates are varied accordingly. Of course, those persons are considered qualified for the highest places whose examinations are the most successful.

16. The qualification of the person examined is stated in the body of the certificate, without any distinction in the form or class of such certificate, which also expresses the substance of the several under gardeners' reports of the conduct of the man, whilst he was in their respective departments.

17. The examinations are verbal and private, and the result of each examination is reported to the first garden committee which may meet after it has taken place.

18. If a man does not pass his examination within three years after his admission into the garden, he is liable to be dismissed by the garden committee.

19. The time bell to summon the men to work is rung by the man on duty in the hot-house department in the morning at daylight in winter, and at six o'clock in summer, except on mowing mornings, when it is rung at five o'clock; it is rung again at eight for breakfast, and at half-past eight for return to work; at twelve for dinner, and one for return to work; and in the evening, for quitting work for the day, at dusk in winter, or six o'clock in summer, the time being regulated by Chiswick church clock.

20. All the men employed in the garden enter at the National School gate, where a person is stationed with a book, in which the names of those entering are fairly written by themselves; and he continues to receive the names until five minutes after the hour in the morning at which the bell for summoning to work shall have ceased to ring; after which time no entry is made. Those who arrive after the expiration of the five minutes, have their names inserted in a separate book, and are fined sixpence each, or in case of their not presenting themselves until breakfast time, are then fined one shilling each. A weekly return of the names, and days on which men are late in the morning, is made by the clerk from this book, which return is regularly entered in a register laid before the garden committee at each meeting.

21. It is the duty of the under gardener in the hot house department to furnish the person who attends to the National School gate.

22. A fine of sixpence for each square of broken glass is regularly levied upon breakers of glass through carelessness, and with that view each under gardener reports weekly, in writing, to the gardener, what glass in his department requires repair; whereupon the gardener examines such report, and having ascertained what fines are to be levied for the breakage, and entered them in the fine-book, countersigns the report, and gives it to the carpenter, who is to consider it an order for the repair of the breakage. The carpenter preserves these orders, and lays them before every garden committee, when an abstract of them is regularly entered in the minutes. The under gardeners' reports express the number and size of the squares broken, and the houses or other buildings to which they belong; and the carpenter is not allowed, on any pretence, to make good any broken squares which he does not find in such reports.

23. All fines levied on the men under the foregoing regulations are entered in a book, and the money accumulating from such fines is expended in the purchase of books for the use of the men.

24. All messages to a distance are performed by messengers, taken from the three departments of the garden alternately, their names being entered in a book kept for the purpose. Messages to short distances are considered to be within the province of the man on duty in the hot house department.

22. No person can be admitted into the garden on Sundays, on any pretence whatever, except by the personal instruction of the gardener or under gardeners, who can give permission to the men to see their friends; care being taken that this permission is granted

sparingly, and only on behalf of persons of the same class as the men themselves. The names of all persons so admitted are written in a book kept at the gate.

26. No person, however, can be admitted into the garden on a Sunday, under the previous regulation, until after the hour of divine service in the morning.

27. If a man is unable to come to his work, his wages are stopped for two days; if he continues ill, half-pay is issued to him till the next meeting of the committee, when his case is reported, together with a statement from the society's medical adviser, as to the nature of his complaint; whereupon the committee order the whole or any part of his pay to be given him, or remove him from the society's service, according to the circumstances of the case.

#### BRUNSVIGIÆ.

A FRIEND of mine called upon me; to him I am indebted for these few hints; he advised me to follow his plan, to which I most readily consented, knowing he had a great collection of Cape Bulbs. He advised me, about the last week in June, to pot them in sixteen size pots, in a strong loam with a good drainage, and laying over the drainage some pieces of turf and a little mould, planting the bulb on this and filling the pot about two-thirds full with the mould, filling the pot up with white sand as high up the throat of the bulb as it will admit, but keep about two inches of the bulb above the level of the pot. If your bulbs are small you must plant them as regards their depth accordingly; for in their native country, the Cape of Good Hope, they grow where the surface is nothing but sand, and their roots reach just where these grow; a sort of clay underneath.

Get some pans or feeders, which you might please to name them, filling them about one-third of white sand, standing the pots in them on the sand, and filling the pans afterwards with the sand, and placing them in a one-light frame, keeping the sand constantly in the pans moist, shutting the frame down and keeping it quite close till there is appearance of growth of some sort. The first year I was not to expect any of them to flower, but as soon as the leaves appeared I gave a little air; as they increased in size, I increased the air still; afterwards I removed them to the warmest and lightest place in the greenhouse; this was to get as large and as fine a foliage as I possibly could. But here I would just mention that as soon as there are leaves making their appearance, it is an indication of their not flowering, and then you may begin to water

in the pots instead of watering in the pans. By keeping the frame quite close it is an imitation of their native country. If the thermometer should rise to one hundred and twenty so much the better, so my friend told me. (Sir W. Herschel, in his pursuits in the Cape, placed a thermometer in the sand and found it to rise to 150 degrees). On the following year I was to place them in the frame, not repotting them (nor for several years to come), moistening the sand in the pans and keeping the frame close, and about the second week in August, 1839, one of the three (the largest) bulbs flowered, as the flowering robbed the bulb or exhausted it very much, it afterwards, the same year, produced small foliage. On the following year one of the other two bulbs flowered, treating them as I did the year before, but the one that flowered first did not flower that year, 1840, nor do I think they will flower in this country two succeeding seasons, but it produced fine foliage. Until this autumn comes I must wait the results. The flower each bulb produced was remarkably fine, and was noticed by many persons who saw them. It threw up a very strong flower stalk, and at the top of the flower stalk it produced twenty-two flowers, and the other, I think, was more; but I wish not to exaggerate. I find this bulb was introduced into this country in the year 1814, but there are notices of this bulb in some French work, though not knowing French I cannot inform you the particular date. The *Amochavis*, or *Brunsvigia Falcata*, requires rather different treatment, although not so much as you might imagine; the pot requires to stand constantly in pans of sand and water, and they throw up their flowers in the spring among their leaves, and they require a plentiful supply of water. The large *Hoemanthus*, such as *Tigveisa Multiflora*, and others, I treat in the same manner as *B. Josephina*. I would just state here, that should there be any persons who are unacquainted with the growth of these bulbs, or have them in their possession, and are unsuccessful in flowering them, I would recommend them to give these few remarks a trial, and follow the few hints, they will, no doubt, have their expectations realized. But never place any bulb, let it be what it may, when dormant, in a shady place, but place it in a sunny and dry situation, frame, or greenhouse, where it can get the full rays of the sun to ripen them in their resting season.

#### GAVIN CREE ON PRUNING.

ARBORICULTURE affords a never-failing source of pleasure to the planter, while its effects give beauty to the landscape. In dropping the acorn, we should not forget that its offspring ought to



be cherished and cultivated, that it may the more surely arrive at that heart of oak, emblematic of the bravery of our people, and which has ever been an ornament and bulwark of defence to our land. We intend to give an outline of a method by which trees may be successfully cultivated, and some of our reasons to prove that method to be judicious. To cultivate wood on physiological principles, it is necessary to have a knowledge of the organs which constitute the internal and external structure of trees, and of the various functions these organs perform through the instrumentality of external agents. Trees are generally treated as if they were mere inorganic matter: they are operated on as the ploughman operates on the ground, or as the carpenter and blacksmith on the wood or iron under their hands. Many eminent men have written treatises on vegetable anatomy and physiology, and many have promulgated their notions on the pruning of forest trees, while neither party understood how the science of vegetable physiology ought to direct the mechanical operation of pruning, so as to make it affect, to the greatest extent, the growth and health of the tree. There is in trees, as in animals, a vital power which presides over all their functions. This power is the agent by which the ascent and descent of the sap is produced, and certain internal and external causes facilitate the exercise of this phenomenon. Among the external causes is to be ranked the influence of air, heat, light, and moisture, and the system of operating on the lateral branches by shortening them.

I shall give an outline of the principles which led me to the conviction that the system of pruning by shortening the lateral branches, which I brought forward a number of years ago, is calculated more than any other, to secure for the benefit of the tree an extra nourishment.

The organs of nutrition or vegetation have one common object to support, namely, life in the vegetable, and the power of these organs may be greatly increased by mechanical means. In order to use these means in a way to assist nature, some knowledge of the physiology of plants is requisite; either the operator or the superintendent must understand how the organs exert their functions, otherwise they cannot reasonably expect to be successful. The different processes of the sap (or vegetable blood) of trees must especially be carefully studied, as by it their growth and vigour are sustained. The sap is acquired and influenced in diverse ways. In spring, the small spongelets or extremities of the roots absorb the fluids and gases from the soil, which are conveyed by an inherent

power depending on the life of the tree, or more properly, the ascending sap is acted on through the roots by atmospheric pressure, up through the capillary tubes, till it reaches the extreme ramifications of the stem, shooting forth buds and expanding leaves. The common sap, having extended over all the branches, mingles with the fluid absorbed by the leaves, and, losing the watery and aëri-form principles, which are useless for nutrition, by evaporation, it returns down the vessels of the bark, and in its course deposits cambium, which forms the annual rings of wood, then extends to and strengthens the extremities of the rootlets, whereby they are made to extract more nourishment from the soil throughout the season, and, as the two saps commingle in the leaves, the descending sap, which has not been deposited in like manner mixes with that extracted by the rootlets, and is again carried up with the ascending sap. All this seems to be analogous to the mode of ventilating mines by means of boxes of unequal lengths, the air descends by the short and ascends by the long one.

How to economise these fluids for the advantage of the tree is next to be considered. It is obvious, then, that when the upper lateral branches are shortened to half the length of the leading stem, and the others proportionally, the sap has less superficies to cover than when they are allowed to extend to an improper length and thickness; in consequence, there is a greater supply for every part of the tree; and as other fluids, such as water, moving in a channel, acquire additional momentum, when augmented, greater vigour and velocity of movement are imparted to the sap by the abundance of quantity; and so great is the beneficial effect resulting therefrom to the tree, that from the extraordinary size and health of the foliage which clothes the branches, it attracts more than three times the nourishment ordinarily imbibed from the atmosphere under different management. Which is the connecting link between the cause and effect.

The branches which are shortened always remain slender. By reason of the small superficies of the branch, and the rapidity with which the sap moves, very little of it is retained by the branch, and, of course, nearly the whole is deposited in the body of the tree. This truth, with the fact that the foliage remains nearly a month longer on the trees so shortened than on others, accounts for the wonderful rapidity of growth effected by this method of pruning. The smallness of the branches is of advantage, likewise, when it is necessary to prune close to the stem, as the wound made by that operation is

proportionally small, and may be expected to cicatrize in the course of three years.

It may be worth remarking, that if the branches are properly shortened, trees never become what is termed hidebound. In the Royal Forests, Lord Glenbervie had instruments for ripping the bark of oaks (which never could increase nutrition), and of scraping off the lichens, but had the branch been judiciously shortened, the descending sap would have been so augmented, through means of a more healthy foliage, as to have obviated the disease, as the bark expands in proportion to the quantity of sap carried down, and if that be abundant it soon clears itself of all impurities. Even mismanaged trees, on which a dryness of bark has occurred, may be brought to a proper condition in the course of three seasons. In cases of this kind, the distance from the body at which the branches are amputated must be regulated by the size of the tree—the larger the tree, the greater the distance.

It has been found, experimentally, that trees under eighteen feet in height, and fifteen inches in circumference, advance, taken averagely, as much, both in height and circumference, in six years, if the branches are properly shortened, as they do in fifteen years if these are not shortened, or improperly pruned. The more trees are pruned up close to the stem before they are eighteen feet high, their growth is proportionally retarded. Trees pruned close to the stem, when the circumference at the part is under fifteen inches, take in the damp, so that the tree, if dissected after a certain period at the part where the branches have been cut, will be found black into the pith. This department of pruning, when improperly managed, is the principal cause of rot, more particularly in the larch. The reason is, the wood in young trees is more open in texture than in older ones.

It is extremely unpleasant and unfortunate that the opinions of writers are so diverse on the pruning of forest trees—a subject, one should imagine, so simple. It would be well in this age, when all the departments of natural history are so much cultivated, if naturalists and rearers of timber would combine their experience on this subject and supply the deficiency. No knowledge can be found in books of any principle so firmly established that all can act on it wisely. How humiliating the truth that there is no standard system on the subject, one fixed in accordance with Nature's laws, in a nation whose boast and glory are her wooden walls!

We must refer the inquiring reader to the several Treatises on Thinning Plantations and Pruning, in the Glasgow Farm Register for

1828, and to the 3rd volume and the 39th number of the Quarterly Journal of Agriculture, and also to Professor Low's first and second editions of Agriculture. W. Scott, Esq., W.S. Convener of the Committee of the Highland and Agricultural Society of Scotland, who awarded the prizes for the Essays for the pruning of Forest Trees for 1836, expressed his high satisfaction with my system and workmanship when I directed and pruned on his estate of Teviotbank in September last.

The Hon. Admiral Fleming expressed his satisfaction, by saying it was the first system of the age. The late Lord Advocate, now Lord Murray, was so satisfied at seeing trees that I had pruned for above twenty years, that it would be of national advantage to adopt the system in the Royal Forests, that he promised he would recommend it in the strongest terms to Lord Duncannon; and I could refer with confidence to the late Sir H. Stewart, Bart.; Sir Thomas G. Carmichael, Bart.; Sir John Nasmith, Bart.; Adam Sim, Esq., Culter Mains; Robert George Bailly, Esq., Culter; David Dickson, Esq., Kilbouch; George Gillespie, Biggar Park; Robert Sommerville, Esq. Corneston; the late Joseph Stainton, Esq. Biggar Shells; the late Capt. Edmonston, Cambus Wallace; James Wyld, Esq. Springfield; Eagle and Henderson, nurserymen, Edinburgh; Dicksons and Sons, ditto; Mr. Cleghorn, ditto; Mr. J. Reid, Leith; Mr. Nicol, ditto; Mr. Barnett, ditto; Mr. Boyd, Falkirk; Mr. Lamb, Selkirk; Mr. Spalden, Peebles; Mr. Thompson, Lanark; Mr. R. Crighton, gardener, Airdrie; and Mr. R. Brewn, forester, Carnwath, for evidence in favour of this system. G. C.

#### PRINCIPAL PLANTS FIGURED IN JANUARY.

*Authorities: Paxton's Magazine of Botany, The Botanical Register, Botanical Magazine, Maund's Botanic Garden, Florist's Journal, &c.*

**CATTLEYA MARGINATA.** — *White-bordered flowered Cattleya.* Class, *Gynandria*; order, *Monandria*; natural order, *Orchidaceæ*.—The gorgeous *Cattleya labiata*, which may be regarded almost as the queen of *Orchidaceæ*, is known to most admirers of the tribe, and at once arrests every observer when it is in blossom. The pretension of the species now figured are more modest, but not less genuine. It is a perfect gem of its class, and becomes additionally interesting from the circumstance of its adaptation to the purposes of the cultivator in a picturesque point of view. To grow it nicely it should be fastened to an old log of wood, and kept in a cool house during the winter.

**PHASEOLUS CARACALLA.**—*The Snail flower.* Class, *Diadelphia*; order, *Decandria*; natural order, *Leguminosæ*.—Many curious instances exist in the vegetable kingdom, in which observers have found some real or fancied similarity to objects in the animal world, and the one before us is by no means the least noticeable. In the spiral form of the folded flowers, ere they are expanded, there is assuredly something not unlike the anatomy of the snail. Having been one of the first exotics cultivated in this country, it has lost much of its attraction in modern times. Indeed, it is rarely seen in collections of stove plants: we learn, however, that it has recently acquired the name of *Glycine* or *Wistaria Harrisonii*, and in that way is being put forth as a novelty. The species is a deciduous stove-twiner, native of the East Indies, bearing long racemes of large flowers, which are of a purple and yellowish hue. In many parts of the south of Europe and the north of Africa, it is grown for culinary purposes; the pods, we presume, being the parts used.—*Mag. Bot.*

**TRIPTILION SPINOSUM.**—*Spiny Triptilion.* Class, *Syngenesia*; order, *Æqualis*; natural order, *Compositæ*.—There is a striking beauty about the vivid blue tint of the blossoms of *Triptilion spinosum*, which must always render it an object of attraction. Its scarcity in collections is attributable to three causes; viz., the sparing way in which it has hitherto been increased, the want of the true desideratum of culture, and the great difficulty attending its preservation during winter. I perpetuate it, says Mr. Glendinning, by division of the roots. It should be divided early in the autumn, that the plants may be established before the damp days arrive. It will resist considerable intensity of frost without injury, and produce seeds, although not freely. I have now plants obtained by both modes of increase. The seeds should be sown immediately when gathered, in light sandy soil, and placed in a warm house. When sufficiently advanced, the plants should be potted singly in small sixties, and kept in a dry part of the greenhouse during winter. The great point in growing the plant is evidently to preserve it from superfluous dampness. To aid in effecting this, the heath-mould in which it is potted should be particularly fibrous and open, and have a little turfy loam and leaf-mould mixed with it, besides a small quantity of broken sandstone.—*Mag. Bot.*

**ACHIMEDES PEDUNCULATA.**—*Long peduncle-flowered Achimedes.* Class, *Didynamia*; order, *Angiospermia*; natural order, *Gesneraceæ*.—The soft and exquisite light purple of the blossoms in *A. longiflora* and the glowing crimson scarlet of *A. coccinea* have here a worthy companion in the deep vermillion and

orange of *A. Pedunculata*; which is likewise a species so peculiar in habit, that it presents a fine change from the others. It was found by Mr. Hartweg, the collector for the Horticultural Society, in the shady woods of Santa Maria, Guatemala, and sent to the Society's garden at the same time as *A. longiflora* and *A. rosea*. One of its chief recommendations is, that it continues to flower late in the season. To have this *Achimenes* in high perfection, it should be grown rapidly when it begins to start. A warm moist atmosphere will best accomplish that object; and if these conditions be supplied through the medium of bottom-heat, they will be all the more congenial. A moderately rich loamy soil is requisite. Throughout the winter the plant will remain in a state of rest; but it does not lose its stems so early as some of its allies, and consequently requires to be watered with caution in the autumn.—*Mag. Bot.*

**LUPINUS ARVENSIS**, Field Peruvian Lupine, *Diadelphia Decandria*; natural order, *Leguminosæ*.—A gay little plant, forming one more addition to the large genus *Lupinus*. The flowers are rich bright lilac, enlivened by a yellow spot on the white centre of the vexillum. It was found growing in corn fields near Loxa, in Peru, by Mr. Hartweg, and flowered in the garden of the Horticultural Society in the course of last autumn.—*Bot. Reg.*

**ANGRECEM PELLUCIDUM**, Transparent Angrec, *Gynandria Monandria*; natural order, *Orchidaceæ*.—We lament to see how little justice our artists have been able to do to this beautiful plant, whose flowers are as delicate and transparent as if they were flakes of snow fixed by frost in the very act of melting. Each part of the lip is studded and bordered with little crystalline elevations, and the whole fabric of the blossom is as fragile as thin plates of glass.—*Bot. Reg.*

**CROCI AUTUMNALES**, Autumnal Crocuses, *Triandria Monogynia*; natural order, *Iridicææ*.—It differs from all known Croci in having white anthers and pollen. The filaments are also remarkable, being yellow and hairy.—*Bot. Reg.*

**TURRÆA LOBATA**, Lobed Turræa, *Monadelphia decandria*; natural order, *Meliaceæ*.—This very rare stove plant flowered at Chiswick-house last July. His Grace the Duke of Devonshire received it from Mr. Whitfield, who collected it in Sierra Leone. The flowers have much the appearance of those of the orange, but have no smell. The nearest affinity of this plant is evidently with the *T. heterophylla* of Smith, a species from the same country, and apparently very like it.—*Bot. Reg.*

**CATLEYA PUMILA**, Bordered Dwarf Cattleya, *Gynandria Monandria*; natural order, *Orchidaceæ*.—This pretty little species is most

assuredly Brazilian, being the No. 657, of Mr. Gardner's herbarium, and having been imported by a French dealer, from that country, under the name of *C. marginata*, a very good name, expressing the appearance of a beautiful pale border to the blood-red blotch of the lip. It should be potted in turfy heath-mould, mixed with a few pieces of potsherds, to keep it as porous as possible. The pot should also be well drained, and the soil considerably elevated above its brim.—*Bot. Reg.*

*EUONYMUS JAPONICUS*, Japan *Euonymus*, *Tetr. pent.-hexandria monogynia*; natural order, *Celestraceæ*.—In all respects this corresponds with the account given by Thunberg, of the Iso Curoggi, or black shore-tree, of the Japanese, even to the sporting into a silver blotched variety, also in our gardens. He says it is in Japan a bush about as high as a man. With us it is not as yet higher than three or four feet, but it has all the appearance of becoming much larger. Although no beauty is to be found in its flowers, this plant is of the same kind of value as the common laurel, phyllireas, and alaternus, being a hardy evergreen shrub, with much the appearance of a small leaved orange. It is easily increased from cuttings of the half-ripened wood, placed under a hand-glass or in a close frame, and shaded in summer. It flowers in July and August, but has not as yet produced fruit. There are two varieties, one with silver striped, the other with gold striped leaves; but the latter is very subject to run back to the green-leaved, while the silver striped hardly ever changes. It is called in many places "Chinese Box," its name when first introduced from Belgium.—*Bot. Reg.*

*MAMMILLARIA TETRACANTHA*, *Four-spined Mammillaria*; class and order, *Icosandria Monogynia*; natural order, *Cactææ*.—This is a melo Cactus, a native of Mexico, and flowers in July; is of a subglobose form, a little elongated, flattened at the top, nearly a span high, and a little less in diameter, everywhere externally formed of numerous *mammillæ* of a conical or pyramidal form, but somewhat angular, between half and three quarters of an inch long. Flowers numerous, small, from the axils of the *mammillæ*, crowded about the depressed portion of the plant, bright full rose-colour, paler in the disk.—*Bot. Mag.*

*CLEMATIS MONTANA*, var. *grandiflora*, *Mountain Virgin's Bower*, large-flowered var., class and order, *Polyandria Polygynia*; natural order, *Ranunculaceæ*.—This handsome variety of the very fragrant *Clematis montana* flowered in the open ground, in the garden of Mr. Veitch, of Exeter, at the same time with the ordinary plant. The profusion of large flowers, the delicacy of their colour, and their fragrance, are strong recommendations. It is a large climber, with

the habit of our own well known Traveller's Joy, having ternate leaves, and leaflets not very dissimilar in form from that species; but with a very different inflorescence, and blossoms, especially in our variety here given, nearly as large as those of *Clematis florida*.—*Bot. Mag.*

*TACSONIA PINNATISTIPULA*, *Mrs. Marryatt's Tacsonia*, or *Passion Flower*; class and order, *Monadelphina Pentandria*; natural order, *Passifloreæ*.—We have had this flowering outside a Cottage until January, in much such a season as the present. It is a very pretty object, being pale rose colour.—*Bot. Mag.*

*CEPHAELIS IPECACUANHA*, *Ipecacuanha*, class and order, *Pentandria Monogynia*; nat. ord., *Rubiaceæ*.—This interesting plant has no beauty to recommend it to cultivation as an ornamental plant; but its value in a medicinal point of view will not be disputed.—*Bot. Mag.*

*GOMPHRENA PULCHELLA*, *Large-flowered Globe-Amaranth*; class and order, *Pentandria Monogynia*; natural order, *Amaranthaceæ*.—Many attempts have been made to introduce into our collections the beautiful *Gomphrena officinalis*, from Brazil, figured by Martius (*Nov. Gen. et Sp. t. 101*), but I believe they have all failed. The next handsomest species yet known to us is the one here represented, which Mr. Veitch, of Exeter, imported from Monte Video, where it was first found by Sellow. It cannot fail to remind us of our own well-known *Gomphrena globosa* (*Bot. Mag. t. 2815*); but the heads of flowers are much larger, and of a brighter, though paler, hue; and whereas the colour of the common globe everlasting is due to the floral bractea, which are longer than the pale-green flowers, here the coloured flowers are much longer than the bractea, and give to the heads altogether a different character. It flowered in July, in Mr. Veitch's greenhouse, appears to be an annual; and in all probability, seedling plants put out in the early summer, would flourish in the open ground, and prove a very great additional ornament to our flower borders.—*Bot. Mag.*

*CONVOLVULUS OCELLATUS*, *Purple-eyed Bind-weed*; class and order, *Pentandria Monogynia*; natural order, *Convolvulaceæ*.—A very neat Evolvulous-like species of Bind-weed, discovered by Mr. Burke at Macalisberg, in the interior of Southern Arica, and raised from seeds in the greenhouse of the Right Hon. the Earl of Derby, at Knowsley, where it produced its pretty white flowers, with a purple eye, in the month of August. I can find no *Convolvulus* anywhere described that corresponds with it. Indeed, I should have referred it to *Evolvulus*, but for the style and stigmas, which are truly those of a *Convolvulus*. The corolla is, as it were, intermediate, between those two

genera, between campanulate and salver-shaped ; scarcely to be called rotate.—*Bot. Mag.*

MAGNOLIA SOULANGIANA, *Soulange's Magnolia*, class, *Polyandria* ; order, *Polygynia* ; natural order, *Magnoliaceæ*.—This hybrid *Magnolia* was raised near Paris, in the garden of the Chevalier Soulange-Bodin, after whom it is named. It was raised from seeds of *Magnolia conspicua*, and there would perhaps be but little hesitation in pronouncing its other parent to be *purpurea* ; this, however, is said not to be the fact, but that it was *tomentosa*. This *Magnolia* forms a more compact shrub, as a standard, than most others of the genus ; and it flourishes in any light loamy soil. It is, however, much increased in beauty of flowering when trained to a wall.—*Bot. Garden.*

FABIANA IMBRICATA, *Imbricate-leaved Fabiana* ; class, *Pentandria* ; order, *Monogynia* ; natural order, *Solanaceæ*.—A newly discovered hardy or half-hardy heath will always be an object of interest ; and the present plant has so exactly the general appearance of one, that it is just as desirable. It has all the neatness and abundance of flowers of some of the best individuals of that genus ; and their habit also, though belonging to a rather distant order. It is tolerably hardy, but may require the assistance of a little defence against severe frosts. It should have a dry situation, and probably sandy peat would suit it better than common soil. Cuttings will strike root quickly, when treated as those of heaths. A plant should be kept in the frame, as a protection against loss, by severity of weather.—*Bot. Garden.*

ACACIA ARMATA, simple-leaved prickly *Acacia* ; class, *Polygamia* ; order, *Monacia* ; natural order, *Leguminosæ*.—A primary subdivision of this genus has been proposed by Mr. Benthham, dependant on a character which may be examined in our present plant. The character to which we allude, is the presence of what are called phyllodia, instead of true leaves. It should be potted in a compost of loam, peat, and sand ; and may be increased by cuttings of the young wood in summer. A south window, in a room without fire, suits it best ; except in severe frosts, when it must be removed during the night. In winter it should be watered very sparingly, but freely when in flower. Before its last flowers have fallen, cut it back, as much as is required to give the plant a regular shape. From the middle of June to the middle of September, plunge its pot in the open border of the garden ; first keeping it out a fortnight in the shade, as sudden exposure to the open sun would discolour its foliage.—*Bot. Gar.*

LONICERA CHINENSIS, *Chinese Honeysuckle* ; class, *Pentandria* ; order, *Monogynia* ; natural order, *Caprifoliaceæ*.—This is one of the prettiest of our honeysuckles, not excepting our

own wild species, with which it forms a pleasing variety.—*Bot. Garden.*

#### PRACTICE.

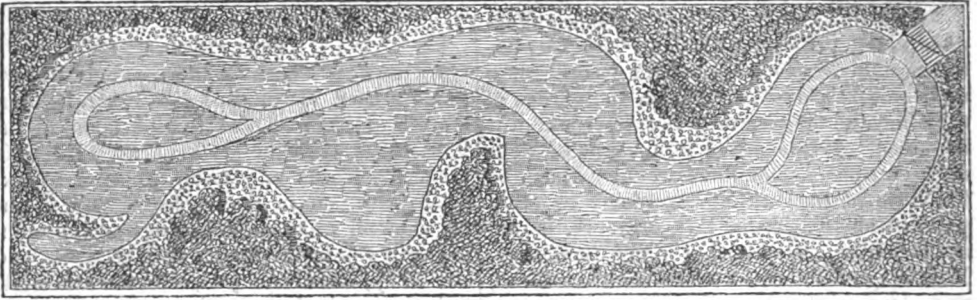
ON CHANGING THE COLOUR OF THE FLOWERS OF THE HYDRANGEA.—What is there more beautiful and cool to look upon, of the flower kind, than the *Hydrangea* ? Placed in the shady piazza or window, it seems to luxuriate with you in the cooling breeze of the hot summer's day, participating and communing with you in the luxury of light, shade, and air. Why, it will cool you, after a warm walk, to look upon its large bright trusses of flowers, contrasting with the broad deep-green foliage. Then let me suggest to those of your readers who may take a delight in this beautiful plant, how they may make it sport its colours, showing some very beautiful blending of shades.

For several years past I have been studying to effect this. Some of my friends have suggested the watering of the plants with soap-suds, from the time the buds begin to expand ; others, a mixture of peat-ashes, or the ashes of pitch pine with the soil. The soap-suds produce a luxuriant growth and large flowers ; and the ashes only cause some very slight change in the colouring of the petals. Others, again, have advised some peculiar compost in which the plants should be grown.

My own experience convinces me that the best compost for the growth of the plant is one half rich garden loam, one fourth old hot bed manure, and one fourth coarse sand, the whole to be well mixed together. The plants should stand in a situation where they will only receive the morning or evening sun for an hour or two. When the buds begin to expand, or after they have half opened, the plants should be watered with water in which has been dissolved saltpetre and oxide of iron, in the following proportions :—to a table spoonful of saltpetre and half a one of oxide of iron add one pail of water. These should be well stirred together, and the whole allowed to stand exposed to the atmosphere a day or more, or until it has acquired a temperature of 70 deg.

I am fully satisfied with the very beautiful variety of colouring which this fine plant produces, under this mode of treatment, and am pleased to communicate this to your readers, hoping that they may meet with the like success : and if they will inform us in return of any thing which will effect any other changes in the tints of the blossoms, they will oblige all who love the *hydrangea hortensis*.

I have always found that plants grown in the ordinary peat mould, such as is taken from Wimbledon Common, came blue, which slips from the same plant grown in loam have come the ordinary colour.



### LAYING OUT GARDENS.

A CORRESPONDENT who says he has taken his lessons from our work has sent us the above as his first effort in a row of gardens which were some where about a hundred and thirty feet long, and forty feet wide. There is no question but his border of shrubs is as we direct, irregular; they are, however, monstrously encroaching in some parts, nearly twenty feet wide, which is out of all character, unless there be some object to conceal. The objection we have to this is the loss of space, where space is really valuable. He states that there was a great object in blocking out his neighbour on both sides, and that where he brought out the plantation so wide was where he required the thickest and largest mass of trees, and that in planting, he has brought them gradually down from the tallest he required at the back to the most dwarf and choice subjects in front, on a regular slope. Nevertheless, we should recommend a reduction of the three large masses, or make within them a retreat, upon the plan of the nook at one corner, but on a larger scale.

Then again, the path should have had a clump or two where there is any manifest bend, because there should always be a reason for every thing, and as roads bend, because there is some obstacle which prevents them from going straight, a path should seem to turn out of its proper course to go round something it could not go over or through. In consequence of the great width of the border of plants, there is no room, or, at least, not proper room, for clumps; therefore, specimen shrubs might be planted on the hollow side of the bend, about six feet apart—three or four might be sufficient. They may be short and choice, so as not to interrupt the space; by all means, too, let the portion enclosed by the loop of the path at each end be formed into clumps. For an amateur, one who knows nothing more of gardening than he can read, the thing is by no means discreditable, but we must give him one or two designs for these long unnatural slips which are peculiar to rows of houses, especially round London.

### OF PRUNING FRUIT TREES.

THERE are gardens that produce fine fruit of a high flavour, and others contiguous to them, whose fruit are not much superior to crabs in relish, although managed (as to pruning) both exactly after the same method. This difference of flavour is generally attributed to the situation, but never to the soil, from a supposition that there is little difference. A good situation is certainly of great advantage to the flavour of fruit; but if the soil is improper, though ever so skilfully pruned, the fruit will not be high flavoured, although often fair and beautiful to the eye. The general method in making the borders in kitchen-gardens, is to make them rich, without regard

to the different kinds of fruit to be planted in them. When thus prepared the trees will often thrive, look well, and produce great quantities of fruit; but it will be very inferior in flavour to the fruit of those trees that are planted in soils which are properly adapted for them.

To remedy this evil, I shall give directions for making the borders fit for all kinds of fruit; and to render this easy, it will be proper to plant a good many of the same sort together, and not promiscuously, which is the general practice; for if they are promiscuously planted, it will be difficult to prepare the borders properly; in that case there must be a change

in the preparation every five or six yards. In small gardens, where there is only room for a few trees, perhaps one or two of a kind, it will be easy to prepare the borders at first; but difficult to keep so many parcels of compost for recruiting them: when that happens, to prevent trouble, all the borders may be made of two sorts, viz—for peaches and cherries (as will be directed under that head) which will answer tolerably well, and is the best way where a gardener is not kept. In large gardens where there is a large collection of fruit-trees, the preparation answers for the same kind of fruit on all aspects. There must always be a quantity of each sort of the compost ready prepared, to lay on the borders every third or fourth year; this will keep the trees many years in good heart, and the fruit will be very high flavoured. It will be of great advantage to the compost, for the borders to be turned over three or four times in a year, and to be two years old before it is used. It will add greatly to its fertility to be turned over in winter when it is hard frozen, and all the frozen parts turned into the inside; it should not be turned when covered with snow, unless it is swept clean.

Having now given directions for the management of the compost, before I proceed any further, shall give general directions for planting all kinds of fruit-trees on walls, dwarfs, and espaliers, on borders and in orchards. Wall trees should never be planted nearer the wall at bottom than nine inches; if they are planted so close for the bole to press against the wall, it often gums and cankers them. The proper distances being marked on the wall (which should be ascertained for each kind of fruit), open a hole a foot square, and sixteen inches deep, in which lay a flat stone at least two inches thick, and on the stone three inches of the mould prepared for planting. The roots of the tree must be pruned so to stand sloping on the mould laid on the stone, the head inclining to the wall; fill up the hole with the planting mould, and tread it gently; then loosen it an inch deep with the spade, after treading it. Cover eighteen inches round the bell of the tree with moss, two inches thick, pressing it flat with the hand; fasten the tree to the wall with a single nail and shred to prevent its being shaken with the wind, but so loose that the tree may not hang by the shred if the ground should chance to sink. There is nothing further necessary, until they are headed down in spring, which should never be done before the buds begin to swell.

The trees for walls are generally brought from some distant nursery, and are some days out of the ground; for which reason all the

small roots must be cut close off the main roots, and these properly shortened, and never left crossing one another. It is preferable for all kinds of wall-trees to have but one stem to be young and vigorous. If the ground is tolerably dry in autumn (after the leaves are fallen), the sooner fruit-trees are planted the better; but if the bottom is of a cold watery nature, the spring is preferable. If the trees to be planted are on the spot, they may be removed with safety, although the leaves are fresh: when that is the case, there is no occasion to cut off any of the small roots; but if they are out of the ground a day, the small roots dry, the bark shrivels, and the tree often decays; for which reason, it is best to let the leaves drop before the trees are removed to a distance.

Clean moss is preferable to all kinds of straw or dung, to lay round new planted trees; it breeds no vermin, and keeps out the frost and drought: great care must be taken not to bring grubs with it from the field, for it is often pulled up in great pieces, in which there are many: it would be worth the labour to lease it all over before it is laid round the trees. The planting of dwarfs or espaliers in the borders of kitchen-gardens, the making of the holes, and laying the flat stones, is the same as for wall-trees; but there is some difference in the manner of pruning the roots. In pruning the roots of wall-trees, those on the side next the wall should be all cut off, as there is no occasion for any but those that point from the wall; but for dwarfs or espaliers the case is quite different; roots should be cut to spread as regular as possible all round, that they may be able to defend the tree, let the wind blow from what quarter it will.

#### REPLETION—A DISEASE INCIDENT TO THE CULTURE OF THE TUBEROSE.

*By John Lewis Russell, Professor of Vegetable Physiology to the Massachusetts Horticultural Society.*

THIS stately and exquisite flower, deservedly a favourite of the florist, and for so many years attracting undiminished attention from the lover of choice plants, is too well known to need a description of its merits, or of the structure of its form. The variety most cultivated is the double or multiplex petalled, and first known in Europe, being grown for many years in only one garden—that of M. de la Court, at Leyden; its confinement to that spot being rendered effective by the annual destruction of its numerous offsets. Indeed, the original species and type is seldom seen, that, among the thousands which have fallen under my observation, for many years past, cultivated in the

gardens of amateurs and florists, but one specimen of the true *Polianthes Tuberosa*, with single and simple corollæ, has occurred.

Having had an opportunity of rearing a promising plant of the double variety this last summer, in lieu of better information I followed the directions laid down in practical treatises concerning its culture. Nothing could have exceeded the strength and vigour and promising appearance of my favoured and carefully tended pet. Indulging myself in the hope that my assiduity would be rewarded by a richness of foliage, surpassed only by the altitude and beauty of the spike, which seemed to give evidence of such a disposition to fulfil my anticipation, I had the misfortune to discover, at the critical moment of its extension for speedy bloom, that an insidious disease had struck a fatal blow on the hitherto green and rich foliage, which gracefully bent in perfection over the pot; the ornament of my casement, and the attracting object of the casual observer. Detecting it in its first approach, I had an excellent opportunity of marking its progress and its effects. At first a single leaf was affected in its centre, perceived by the withering of that portion. On the next day two or three more were similarly attacked. A day after, and nearly all were in the same condition. Satisfied that no insect had committed these ravages, I was led to a microscopic investigation, in order, if possible, to trace the inward and physiological source. The epidermis, or covering of the upper side of the leaf, was dry and withered, and this extended as far as the disease seemed to affect the portion of the leaf. Its colour was perfectly white, and similar to satin. The epidermis of the under surface was less dry and withered. The parenchyma, or pulp, was more or less destroyed, and all that sustained the remnant of the leaf was a narrow line of healthy matter on each side of the central withered portion. Irregular, transverse, dark lines were apparent through the epidermal tissue. Submitted to a powerful lens, they were ascertained to proceed from ruptures of the internal vessels, which permeate the parenchyma.

The perspiration of plants is a well known law of vegetable economy. In most instances this is imperceptible, although very apparent in some remarkable cases. In endogenous plants, to which group belongs the subject of this memoir, this perspiration or exudation is effected generally at the tip of the foliage. Excess of nourishment is as prejudicial to the plant as to the animal. If by any cause the plant cannot dispose of its superfluous supply, the structure, unable to meet such fearful exigencies, becomes diseased, and incapable of its healthy and natural function. This, I had

reason to think, was precisely the case in this instance. Erring in following too literally the injunction "to water freely" on the swelling of the buds, repletion was the ultimate effect. Rendered more cautious by a detection of the mischief, I was, by a more spare application of water, enabled to bloom any specimen with tolerable show, although so sadly disfigured in foliage. From such experience, it may not be too bold to presume that the *Tuberosa* does not require that free watering hitherto recommended. Somewhat succulent in its structure, it is capable of resisting much more heat and dryness than might be supposed. Further experiments on this interesting subject may perhaps develop important facts, which shall serve as hints to the florist. Many of the prescribed rules for floriculture are exceedingly objectionable, because derived more from traditional knowledge than from constant experiment; while it is evident, to insure complete success, a philosophical and inquiring spirit should be the highest teacher and guide.

#### FLORISTS' FLOWERS.

If we knew how to infuse a little spirit into the growers of florists' flowers, we should set about it in good earnest, for it is mortifying to see the most splendid of all the garden beauties neglected; and nothing can be more obvious than the falling off which we have to deplore. Whence can this neglect arise? We are almost ashamed to own our conviction is strong, that one of the causes is—idleness. Another, perhaps, is the want of an example among those whose influence used to be great, and would again be so if used. A third is, the want of proper encouragement from those who can afford to promote so good an object. A fourth, and perhaps the last we shall mention, may be the general depression which limits the means of the working classes.

The first cause, idleness, seems very apparent; for those flowers which require the most trouble to cultivate in perfection are the most neglected, and this fact may be observed by every body. For instance, the pink—a flower beautiful in itself, possessing properties which render it a favourite with every body; the perfume is exceedingly fine, its symmetry conspicuous, the means of raising seedlings are easy, and the capacity for improvement is great; but to grow them well requires care, attention, application, and perseverance; and these are, we presume, too much for ordinary people. It is not many years since this flower was grown by many enthusiasts, who maintained that it was the best of all florists' flowers. And it was no uncommon thing to find a dozen very fine stands in a show-room. Why should it not



be so again? Another proof that it is idleness is, that the same people may be found eagerly cultivating subjects not half so beautiful, merely because they are less trouble. The second cause—the want of example among those whose influence would be useful—is almost a modification of the first; for it is idleness that operates with those whose neglect is so conspicuous, and who must take the lead to prevent the total abandonment of the fancy. The third cause—the want of encouragement—is very apparent; for it is not merely offering prizes that will cause a flower to be cultivated; there must be a sort of emulation to excel excited, before the prizes will be valued beyond their intrinsic worth, and without this the trial will be confined to the mere mercenary growers, who would take no more interest in growing a pink than in growing a cabbage, and who simply calculate whether the prize will pay them for their time and trouble.

The encouragement required is from persons who usually take the lead in such things, and who will attend the shows, and descant on the properties of old flowers, and discuss the merits of new ones; who will sit down and dine with the showmen, attend their meetings, and give, by their personal presence, that sort of countenance which can alone excite men to trials of skill. The fourth, and most important of the causes, may be properly traced to the altered condition of the working classes, to whom belongs the larger portion of the credit due for the improvement of this beautiful class of garden productions. This is to be deplored; but even this could be counteracted greatly by the encouragement which the more wealthy could give if they pleased, by taking up the cultivation themselves, by liberally purchasing whenever the less fortunate could sell. But of late, those who could afford to cultivate and encourage the fancy flowers have sadly neglected the cause.

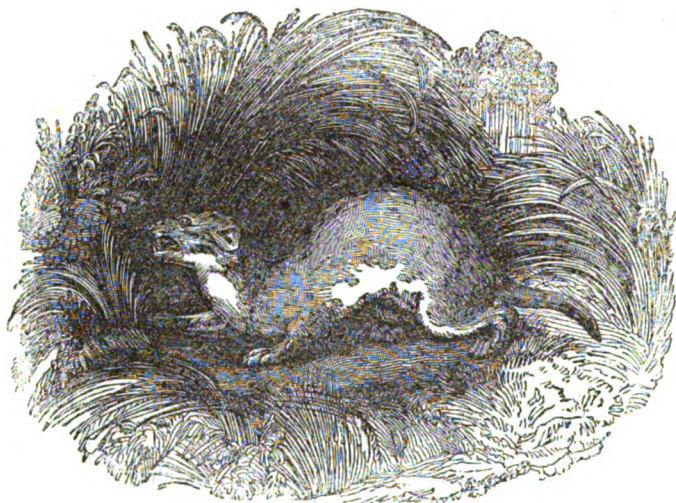
We will not mention names, but there are many who will take to themselves this reproach—that they who have been, and perhaps still are, enthusiasts themselves, are not seen at the only meetings where such matters are discussed—that they have gradually withdrawn themselves from the associations formed for such purposes—and that some, who could well afford to double and treble their former subscriptions, have confined themselves to the cold-hearted payment of their annual stipend, and others have gradually withdrawn altogether. Now, whether we look to the interest which such meetings as we have described possess in themselves, to the rational recreation which they encourage, the emulation they excite, or the benefit which society at large de-

rives from the promotion of floriculture, this is every way to be regretted. Who is there can attend a meeting which once boasted all the choice spirits of the age, all the enthusiasts of the fancy, and not lament all its defalcations by death, and the deficiency of those to whom scores have looked up with respect, and whose examples have been followed by very many who have been by them first led into the fancy? Business is the excuse; a fair one enough if nobody valued their company or their conversation, but a most insufficient one, if the importance of what they neglect be considered for a moment. Those who desire to promote any object which comprises a large share of public good, should recollect that men value active zeal far beyond mere liberality. There is not a man, whatever may be his circumstances, but would go farther to serve one who asks him to partake of anything with him, than he would another who threw him a shilling. It is the mixing with their fellow-men that does the good, not the contributions of the sovereigns; the one is valued because it cannot be bought, the other is valued only for its amount. A man may possess great liberality, and volunteer vast *money services*, and they will be appreciated; but another man may throw in his mite with the rest, and, by joining in their social meetings, confer that which cannot be sufficiently valued; and this is the person who does the good. This, however, all applies generally to the fancy. We have only talked of the pink,—next to this flower for trouble, and consequent neglect, is the carnation; then the auricula, the ranunculus, and the tulip: the same argument applies to the whole in different degrees. Persons who will cut flowers for an exhibition, in which the sight of the blooms will be confined to their own dinner table, will begrudge the time, trouble, or flowers, or perhaps all three, that must be given up for an exhibition, where the flowers are to be seen by hundreds! And this cannot be the way to promote a fancy which is tottering for want of countenance and support! And what, let us ask, was the first effect of all this neglect? Why a reduction in the price of tulips, a lessening of the demand, and a consequent diminution in the value of every man's collection. Is this desirable? Ought not all the old growers to rally round the young ones? Ought the resources, the energies, the means, or the interest, to be divided by one half the professed friends going one way, and the other half the other? Ought they who were the first to support a society for the advancement of a particular object, to neglect its interests and abandon its meetings, after many have become members on their invitation? Surely this one species of discouragement is enough to account for one half of the

indifference with which men look at the fancy. Who can wonder at the apathy of the growers *in general*, when they are openly neglected by the growers *in particular*? We have looked year after year, with regret at the growing indifference of the best cultivators; and we have deplored the splitting of large societies into smaller ones, from a conviction that the cause suffers.

Nothing could contribute so much to the advancement of this branch as the association of all classes of growers in one central society, and their attendance at occasional meetings. Nothing has tended so much to disparage the interests, weaken the energies, and destroy the emulation of all the friends of science, as the establishment of little coteries, which draw off the attention of many leading

promoters. There are some seceders who can well be spared, men who are neither useful nor ornamental; but there are others who, in their new fangled schemes, should not forget old associations, and whom we should like to see giving up an occasional hour for the benefit of the younger fanciers, and affording them the advantage of their experience and their conversation. We should like to see the florists' flowers taken up as they ought to be, and we believe the day is not far off, when some of those who might almost claim to be the fathers of the fancy, instead of withdrawing from the circles in which such subjects are discussed, will join again the society of those who still cultivate their favourites, and participate in the animated discussions which characterised the enthusiasts of former days.

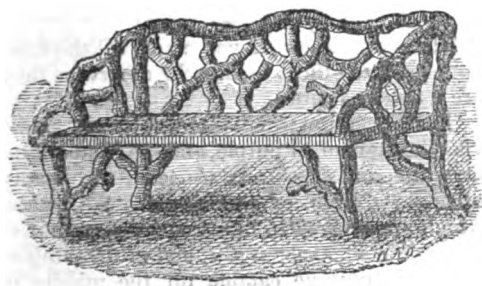


#### PALMER'S PATENT GLYPHOGRAPHY.

WE this day present to our readers a specimen of the new art of Glyphography, by means of which all the effect of the most beautifully executed wood engravings can be produced on copper, and be printed with the ordinary type with much greater facility than even the best wood blocks. The plates or blocks are produced by the Electrotpe, and the process is exceedingly simple, the beauty of the work depends entirely on the capacity of the artist; for every blemish and every beauty, is as accurately fixed as the mirror shadows whatever is before it. In wood-engraving, the most perfect drawing that was ever made on a block may be spoiled by the engraver; whereas, in the process of Mr. Palmer, whatever the draughtsman can perform, the Electrotpe perpetuates; and, if Sir

Thomas Lawrence himself were alive, and executed one of his finest portraits, the most delicate and minute touches would be faithfully transferred to the face of the copper, and thence to the paper. In this, one fact is enough to give it a preference over wood engraving, and for many purposes wood engraving has a decided advantage over copper plate engraving, particularly in the facility of working it with type. The process is simple. A plate prepared with a ground something like that for etching, and capable of receiving the most delicate touches, is submitted to the artist, who has only to draw the subject, which drawing removes the ground. This plate is placed in a solution of copper, and the galvanic battery is applied to precipitate it in a solid metallic form until it is thick enough

for use, generally about the eighth of an inch. When this plate is removed from the other, it has the subject in relief, and being mounted on wood to the height of ordinary type like a stereotype plate, it is ready for printing, and would give thirty thousand copies, or, as the extent has not been tried, it may be many thousand more. The subjects now given are not intended to show off the artist but the process, and as we intend to continue our embellishments by this process, and to employ first-rate artists, we shall soon be able to show how delicately and perfectly the most elaborate subjects may be produced. In an early number we shall give full instructions, by which the amateur artist will be enabled to avail himself of the invention to multiply any subject; more particularly as it is admirably calculated for sketches of garden scenery.



ON THE BRASSICA.

## PART I.

**BRASSICA.** — The Cabbage. — The Species are, *B. Oleracea*; the common white cabbage. *B. Napobrassica*; turnip-rooted cabbage. *B. Botrytis*; the cauliflower. *B. Sylvestris*; tall shrubby sea cabbage. *B. Violacea*; cabbage with entire, oval, spear-shaped, smooth leaves, which are indented. *B. Purpurea*; cabbage with oblong heart-shaped leaves embracing the stalks, which are entire. *B. Orientalis*; colewort with heart-shaped smooth leaves which embrace the stalk. *B. Gongylodes*; the wild navew, or cole seed.

The varieties of the first sort, the common white cabbage, are, *B. Sabauda*; the savoy cabbage, commonly called savoy. *B. Rubra*; the red cabbage. *B. Pyramidalis*; the sugar-loaf cabbage. *B. Præcox*; the early cabbage. *B. Peregrina*; foreign musk cabbage. *B. Muscovitica*; small Russia cabbage. *B. Capitata*; the large sided cabbage. *B. Viridis*; the green savoy. *B. Laciniata*; the borecole. *B. Selenisia*; green borecole. *B. Fimbriata*; Siberian borecole, called by some Scotch kale.

The second sort, the turnip rooted, is undoubtedly a distinct species, for the seeds pro-

duce the same, with this difference only, that in good ground the stalks will be much larger than in poor land.

The varieties of the third sort, the cauliflower, are, purple broccoli, white broccoli.

The second sort grows naturally on the seashore, near Dover. It hath a perennial branching stalk, in which it differs from all the other species. The young shoots after they had been much frozen, are very sweet and good; but at other times they are very strong and stringy. In very severe winters, when the other sorts are destroyed, this is a necessary plant, for the most severe frosts do not injure it.

Miller says, the third sort, which is the cauliflower, has been supposed a variety of the common cabbage; but from more than fifty years' experience in cultivating these plants, I could never find the least appearance of either species approaching each other; and they are so different in their leaves, as to be easily distinguished by persons of skill, when the plants are young. But there is one essential difference between them in their flower-stems; for the common cabbage puts out one upright stem from the centre of the cabbage, which afterward divides into several branches, whereas the cauliflower sends out many flower-stems from the part which is eaten; which is only a compact collection of the heads of these stalks, which afterward divides into so many stems, branching out into many spreading shoots, so as to form a large spreading head when in flower, but never rises pyramidically like the cabbage.

The two sorts of broccoli I take to be only varieties of the cauliflower, for although these may with care be kept distinct, yet I doubt, if they were to stand near each other for seeds, if they would not intermix; and I am the rather inclined to believe this, from the various changes which I have observed in all these sorts; for I have frequently had cauliflowers of a green colour, with flower-buds regularly formed at the ends of the shoots, as those of broccoli, though the colour was different; and the white broccoli approaches so near to the cauliflower, as to be with difficulty distinguished from it; yet when these are cultivated with care, and never suffered to stand near each other, when left to produce seeds, they may be kept very distinct in the same garden; for the variations of these plants is not occasioned from the soil, but the mixing of the farina of the flowers with each other, where they are planted near together; therefore those persons who are curious to preserve the several varieties distinct, should never suffer the different kinds to stand near each other for seed.

The cauliflower was first brought to England from the island of Cyprus, where I have been

informed they are in very great perfection at present: but it is supposed, they were originally brought thither from some other country: most of the old writers mention it to have been brought from that island, to the different parts of Europe, so that from thence all the gardens in Europe have been supplied; and although this plant was cultivated in a few English gardens long since, yet it was not brought to any degree of perfection, till about 1680, at least not to be sold in the markets; and since the year 1700, they have been so much improved in England, as that such of them as before were greatly admired, would at present be little regarded.

This plant has been much more improved in England, than in any other parts of Europe. In France they rarely have cauliflowers till near Michaelmas, and Holland was for a long time generally supplied with them from England. In many parts of Germany there was none of them cultivated till within a few years past; and most parts of Europe are supplied with seeds from hence.

The eighth sort, which is generally known by the title of rape or cole seed, is much cultivated in the isle of Ely, and some other parts of England for its seed, from which the rape oil is drawn; and it hath also been cultivated of late years in other places, for feeding of cattle, to great advantage.

The cole seed, when cultivated for feeding of cattle, should be sown about the middle of June. The ground for this should be prepared in the same manner as for turnips. The quantity of seeds for an acre of land, is from six to eight pounds, and as the price of the seeds is not great, so it is better to allow eight pounds; for if the plants are too close in any part, they may be easily thinned when the ground is hoed. When the plants have put out six leaves, they will be fit to hoe, which must be performed in the same manner as is practised for turnips, with this difference only, of leaving these much nearer together; for as they have fibrous roots and slender stalks, so they do not require near so much room. These plants should have a second hoeing, about five or six weeks after the first, which, if well performed in dry weather, will entirely destroy the weeds, so they will require no farther culture. By the middle of November these will be grown large enough for feeding, when, if there is a scarcity of fodder, this may be either cut or fed down; but where there is not an immediate want of food, it had better be kept as a reserve for hard weather, or spring feed, when there may be a scarcity of other green food. If the heads are cut off, and the stalks left in the ground, they will shoot again early in the spring, and produce a good second crop in April, which may be either

fed off, or permitted to run to seeds, as is the practice where this is cultivated for the seeds: but if the first is fed down, there should be care taken that the cattle do not destroy their stems, or pull them out of the ground. As this plant is so hardy as not to be destroyed by frost, so it is of great service in hard winters for feeding of ewes; for when the ground is so hard frozen, as that turnips cannot be taken up, these plants may be cut off for a constant supply.

The common white, red, flat, and long-sided cabbages are chiefly cultivated for winter use.

The Russian cabbage was formerly in much greater esteem than at present, it being now only to be found in particular gentlemen's gardens, who cultivate it for their own use, and is rarely ever brought to the market.

The savoy cabbages are propagated for winter use, as being generally esteemed the better when pinched by the frost.

The borecole are never eaten till the frost hath rendered them tender, for otherwise they are tough and bitter.

The broccoli, of which there are several kinds, viz., the Roman, or purple, and the Neapolitan, or white, and the black broccoli, with many other sorts, begin to show their small heads, which are somewhat like a cauliflower, but of a purple colour, about the end of December, and will continue eatable till the middle of April.

The brown or black broccoli is by many persons greatly esteemed, though it doth not deserve a place in the kitchen-garden, where the Roman broccoli can be obtained, which is much sweeter, and will continue longer in season: indeed, the brown broccoli is much hardier, so that it will thrive in the coldest situations, where the Roman broccoli is sometimes destroyed in very hard winters.

The Roman broccoli (if well managed) will have large heads, which appear in the centre of the plants, like clusters of buds. After the first heads are cut off, there will be a great number of side shoots produced from the stems, which will have small heads to them, but are full as well flavoured as the large. These shoots will continue good until the middle of April, when the asparagus will come in plenty to supply the table.

The Naples broccoli hath white heads, very like those of the cauliflower, and eats so like it, as not to be distinguished from it. This is much tenderer than the Roman broccoli, so is not so much cultivated in England; for as the gardens near London generally produce great plenty of late cauliflowers, which, if the season prove favourable, will continue till Christmas, the Naples broccoli, coming at the same time, is not so valuable.

The turnip-rooted cabbage was formerly more cultivated in England than at present, for since other sorts have been introduced which are much better flavoured, this sort has been neglected. There are some persons who esteem this kind for soups; but it is generally too strong for most English palates, and is seldom good but in hard winters, which will render it tender and less strong.

The curled colewort or Siberian borecole, is now more generally esteemed than the former, being extremely hardy, so is never injured by cold, but is always sweeter in severe winters than in mild seasons. These will be fit for use after Christmas, and continue good until April, so that they are very useful in a family.

The musk cabbage has, through negligence, says Miller, been almost lost in England, though for eating it is one of the best kinds we have; but being tenderer than many other sorts, is not profitable for gardeners who supply the markets; but those who cultivate them for their own table, should make choice of this, rather than any of the common cabbage, for it is always looser, and the leaves more crisp and tender, and has a most agreeable musky scent when cut.

The common colewort, or Dorsetshire kale, is now, says the same author, almost lost near London, where the markets are usually supplied with cabbage plants, instead of them; and these being tenderer and more delicate in winter, are much more cultivated than the common colewort, which is better able to resist the cold in severe winters than those, but is not near so delicate till pinched by frost. And since the winters in England have been generally temperate of late years, the common cabbage plants have constantly been cultivated by the gardeners near London, and sold in the markets as coleworts, which, if they are of the sugar-loaf kind, is one of the sweetest greens from December to April yet known. Indeed, where farmers sow coleworts to feed their milch-cattle in the spring, when there is a scarcity of herbage, the common coltwort is to be preferred, as being so very hardy that no frost will destroy it.

The perennial coltwort is also little cultivated in the gardens near London at present. This is very hardy.

The fifth sort came from China, where it is cultivated as an esculent plant; of this there are two or three varieties, but I find them as variable as our common cabbage. These are annual plants, which, if sown in April, will flower in July, and perfect their seeds in October. They never close their leaves to form a head, like the common cabbage, but grow open and loose, more like the wild Navew, and are very unfit for the table.

The other two sorts of cabbage are varieties fit for a botanic garden, but are plants of no use.

The best method to save the seeds of all the best sort of cabbages is, about the end of November you should make choice of some of your best cabbages, plant them in some border, under a hedge or pale, away from every other description of Brassica. In the spring of the year these cabbages will shoot out strongly, and divide into a great number of small branches: you must therefore support their stems, to prevent their being broken off by the wind; and if the weather should be very hot and dry when they are in flower, you should refresh them with water once a week all over the branches, which will greatly promote their feeding, and preserve them from mildew.

When the pods begin to change brown, you will do well to cut off the extreme part of every shoot with the pods, which will strengthen your seeds; for it is generally observed, that those seeds which grow near the top of the shoots, are very subject to run to seed before they cabbage; so that by this time there will be no loss, but a great advantage, especially if you have more regard to the quality than to the quantity of the seeds, which indeed is not always the case, when it is intended for sale; but those who save it for their own use, should be very careful to have it good.

When your seeds begin to ripen, you must be particularly careful that the birds do not destroy it; for they are very fond of these seeds.

When your seed is fully ripe, you must cut it off; and, after drying, thresh it out, and preserve it in bags for use.

But in planting cabbages for seed, never plant more than one sort in a place, or near one another: as for example, never plant red and white cabbages near each other, nor Savoy with either white or red cabbages; for they will produce a mixture of kinds; and it is wholly owing to this neglect, that the gardeners rarely ever save any good red cabbage-seed in England, but are obliged to procure fresh seeds from abroad, as supposing the soil or climate of England alters them from red to white, and of a mixed kind between both; whereas, if they would plant red cabbages by themselves for seeds, and not suffer any other to be near them, they might continue the kind as good in England, as in any other part of the world; for in the Dutch gardens, from whence the best seeds of red cabbages are procured, they cultivate no other sort.

Cauliflowers have of late years been so far improved in England, as to exceed in goodness and magnitude what are produced in most parts of Europe; and by the skill of

the gardener are continued for several months together; but the most common season for the great crop is in May, June, and July.

The old gardeners used to sow it about the 21st of August, upon an old cucumber or melon bed, sifting a little earth over the seeds, about a quarter of an inch thick; and if the weather proved hot and dry, shaded the bed with mats, to prevent the earth from drying too fast, which would endanger the seed. Gentle waterings as occasion required. In about a week's time the plants appear above ground, when they take off coverings by degrees, but do not expose them too much to the open sun at first. In about a month's time after sowing the plants are fit to prick out, they therefore put some fresh earth upon old cucumber or melon beds, or, where these are not to be had, some beds are made with a little new dung, which is trodden close, to prevent the worms from getting through it; but not hot dung, which would be hurtful to the plants at this season, especially if it proves hot; into this bed they prick the young plants, at about two inches square, observing to shade and water them at first planting, but not watering them too much after they are growing, nor suffering them to receive too much rain.

In this bed they continued till about the 30th of October, when they were removed into the place where they were to remain during the winter season, which, for the first sowing, was commonly under bell or hand glasses, to have early cauliflowers; but in order to have a succession during the season, they were provided with another more late kind, sown four or five days after the other, and managed as was directed for them.

In order to have very early cauliflowers, they made choice of a good rich spot of ground, well defended from the north, east, and west winds, with hedges, pales, or walls. This ground was well trenched, burying therein a good quantity of rotten dung; then levelled, and if naturally a wet soil, raised up in beds about two feet and a half or three feet broad, and four inches above the level of the ground, but if moderately dry not raised at all. They were planted two feet six inches distance from glass to glass in the rows, always putting two good plants under each glass, four inches from each other; and if designed for a full crop, three feet and a half row from row.

When planted, if the ground was dry, a little water was given, and the glasses set over them, which remained close down upon them until they had taken root, which was in about a week or ten days' time, unless there was a kindly shower of rain, in which case they set off the glasses, that the plants might receive the benefit of it; and in about ten days after

planting, they provided a parcel of forked sticks or bricks, with which to raise the glasses about three or four inches on the side toward the south, that the plants might have free air. In this manner the glasses remained over the plants night and day, unless in frosty weather, when they were let down as close as possible; if the weather proved very warm, which many times happens in November, and sometimes in December. They kept the glasses off in the day time, and put them on only in the night.

Toward the latter end of February, if the weather proved mild, they prepared another good spot of ground, to remove some of the plants into from under the glasses, after making choice of one of the most promising plants under each glass, to remain for good, took away the other plant, by raising it up with a trowel, &c., so as to preserve as much earth to the root as possible; but had a great regard to the plant that is to remain, not to disturb or prejudice its roots; then planted the plants taken out, at the distance before directed, viz., three feet and a half, row from row; then, with a small hoe, earthed up the stems of the plants which were left under the glasses, taking great care not to let the earth fall into their hearts; and set the glasses over them again, raising the props an inch or two higher than before, to give them more air, observing to take them off whenever there were gentle showers, which greatly refreshed the plants.

In a little time after, when the plants filled the glasses with their leaves, slightly dug about the plants, and raised the ground about them in a bed broad enough for the glasses to stand about four inches high, which gave the plants a great deal of room by raising the glasses so much higher, when set over them; and by this means they were kept covered until April.

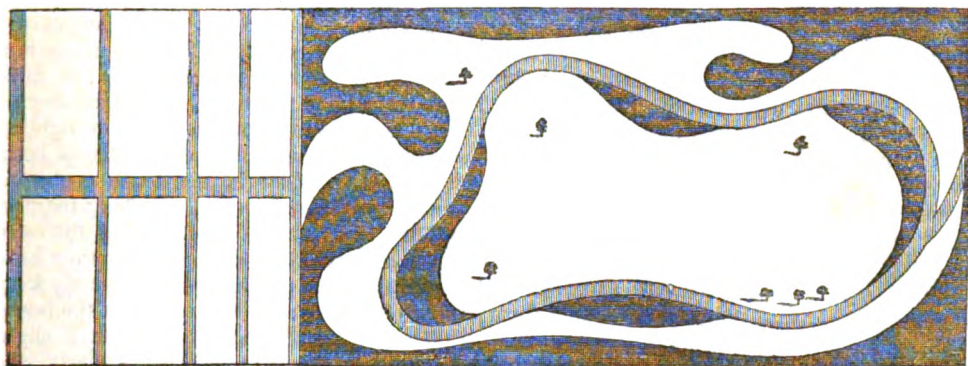
It is advisable to let your glasses remain over them as long as possible, if the nights should be frosty, which will greatly forward your plants; but be sure do not let your glasses remain upon them in very hot sunshine, especially if their leaves press against the sides of the glasses; for the moisture has risen from the ground, and when the sun has shone hot upon the sides of the glasses, they have acquired such a powerful heat from the beams, as to scald all their larger leaves, to the no small prejudice of the plants: nay, sometimes I have seen large quantities of plants so affected therewith, as never to be worth any thing after.

If your plants have succeeded well, towards the end of April, some of them will begin to fruit; you must therefore look over them carefully every other day, and when you see the flower plainly appear, you must break



down some of the inner leaves over it to guard it from the sun, which would make the flower yellow and unsightly, if exposed thereto; and when you find your flower at its full bigness (which you may know by its outside parting, as if it would run), you must then draw them out of the ground, and not cut them off, leaving the stalk in the ground, as is by some practised; and if they are designed for present use, you may cut them out of their leaves; but if designed to keep, you should preserve their leaves about them, and put them into a cool place: the best time for pulling of them is in a morning, before the sun hath exhale the moisture; for cauliflowers pulled in the heat of the day lose that firmness which they naturally have, and become tough.

T.



## FORMING GARDENS.

A CORRESPONDENT has requested us to give him some hints as to the best mode of laying out a slip of ground behind his house, so as to make the portion next the dwelling, shrubbery and lawn, and the most remote part a kitchen garden. We can only say that such things are not done every day, but that we have given a rough sketch of what he may do with it if he should so please. The clumps at the end hide the actual place of entry into the kitchen garden, and probably the other, with a little modification, will give his lawn and shrubbery an appearance of as much space as can be well shown in a place boxed up with four walls, the side ones of which are not more than twenty yards apart. Our artist has not been very exact as to the size of the clumps and the width of the path, but we give it merely as an idea upon which our correspondent may either work or improve.

## GLENNY'S GARDEN PRACTICE.

## KITCHEN GARDEN.—FEBRUARY.

THE operations this month are given quite independent of those for January. The amateur will be guided of course by what he has already done, but in the sowing of peas and beans, sallads, or any other crops which come in a given time, and are used off in short periods, the only consideration is the quantity. I sowed peas every three weeks or a month from the time I began until there was no chance of their coming, for I hold it to be always worth risking the price of the seed to get a dish of peas out of season, or rather I should say very early or very late in the season. In the kitchen garden therefore, there is great similarity in the directions for the winter months, and I recommend them to be read from November to the present time, as almost everything directed for the first will do for the present,

and everything that has not been done, and can yet be done, should be at once attended to. The month of February is often very wet, and ground too often unfit for work, for nothing does more mischief than pressing the earth close by walking over it when it is sodden. By this time I take it for granted that all vacant spaces have been dug, dressed, and left rough or in ridges. Presuming, however, the weather to be favourable, all the following may be done with advantage:—

POTATOES.—Plant a few in the warmest border you have, a row close at the foot of a south wall or paling, or hedge, the earth being well sloped. The best sort will be the ashleaved kidney; plant the tubers whole, I should dry and level a place all the way along, regardless of what crop I might want in front of them; bruise

the earth properly with the spade, then on the soft surface lay the whole potatoes a foot apart, in a row nine inches from the wall or fence, then dig some earth and throw on them so as to form a bank a foot high behind them and four inches high just over the sets, bringing it down to nothing.

The chance of bringing this first little crop to perfection depends on keeping them moderately dry, and at all events by making the sloping bank throw off all rain, it enables you to regulate the water they shall have. Towards the end of the month you may plant a few more, by drawing a drill along the level ground, and covering them by drawing four inches of earth over them. When they come up, straw or litter must be kept near, to throw over them during frost, and always of a night, lest a frost should come before morning. Although I prefer the ash leaf kidney to any other for this early work, there are newer sorts rapidly coming into the market that may be worth trying. I have also been very successful in planting Potatoes in pots, and planting them out, with the ball of earth entire, as soon as the pots have become filled with roots. These pots may be placed almost on any shelf, and for a time, until they are up, even under a shelf, but when up they must have a good place, and when planted out it must be under a wall, where they must be earthed up directly, and all the precaution taken as regards litter, &c. Potatoes may also be planted in an old melon or cucumber bed, fresh lined, or in a bed (formed for the purpose) of hot stable dung, and covered with frame and glass. If in an old bed, the earth should be stirred up and levelled, the potatoes laid in rows, nine inches apart, and the tubers themselves six inches apart in the row, and three inches of good loam put on the top of them. In this case they are regularly forced, nevertheless, since Chapman's kidney, which is equal to a new Potato from Christmas to May, has been distributed, I do not think any Potato worth forcing; you may try them under a south wall, but they are not worth the trouble of a hot bed, particularly as you can plant Chapman's in July and August, take them up in November, and preserve them in common pits, as handsome, as tender, and well flavoured as any new Potato from a hot bed.

Continue renewing the linings of declining hot beds, in which forcing is going forward, or where Cucumbers are growing, and make new beds.

ASPARAGUS declining to be productive from exhaustion may be taken out of the hot bed, and the surface levelled; the bed will be in a proper state for many purposes, as there will be still slight heat, which may be improved

from time to time by linings. Make new beds with other plants to succeed those declining, if you want a further supply.

MUSHROOMS. — Unless you have provided yourself before, make beds now; see previous directions.

RHUBARB. — For forcing see directions for former months.

KIDNEY BEANS may be sown in pots, three in a pot, and a common hot bed be filled with them to force; plenty of air must be given from time to time to prevent their drawing; or they may be placed on the top shelves of a greenhouse, or the front shelves of a hot-house, or a small greenhouse may be filled with them, and heat given, but in forcing things avoid the common error of lighting fires only of a night. The fire should be in all day, and the air in the house cooler instead of warmer of a night; nothing requires so much heat, nor does any thing thrive so well in so much heat, when dark, as they have when light. The proper way is to merely keep frost well out of a night, and to get the house up ten degrees warmer by day, but if slight fires are kept up night and day regularly, the difference of temperature will be natural.

SMALL SALLADING, LETTUCE, &c. — Continue to sow in any of the ways already recommended; you may also choose a warm border, where they can be easily protected with straw, matting, hand-glasses, cloth, or straw covering.

CAULIFLOWER PLANTS, whether in frames or under hand-glasses, under hoops and mats, or merely in warm borders, protected in bad weather by litter, should be examined often, dead leaves picked off, deceased plants removed, and slugs, snails, &c., carefully hunted and destroyed. Those plants which are under hand-glasses in the open beds may be reduced to two at the most under each glass, but leave the best two, at the end of the month; and if the weather prove hard and unfavourable, it may be deferred till March, those you remove may be planted out two under a glass in the same way. Sow seed on a moderate hot-bed with a frame and glass to it, let there be three or four inches of good loam, sow the seeds thinly and evenly over the surface and cover them completely but no more, by sifting other loam over them, give air when they come up by tilting the glass at the upper end a little. If you have no frame and glass, sow in patches to cover with a hand-glass, or if you have none, hoops and a mat.

CABBAGES. — Sow according to the weather, Cabbage seed early or late in this month, or sow some at the beginning, and some at the end of the month. Sow also Savoy seed at



the end of the month. Plant out whichever kind of cabbage you intend to save seed from, but do not plant two sorts, for unless they are very far apart one will spoil the other; plant your best specimen any where out of the way, or if you save in quantity plant some of the best two feet apart.

**CELLERY.**—Must be earthed up continually as fast as it grows, on dry days only. Sow a small portion of seed as directed for cauliflowers, indeed you may sow it in the same bed, so indeed you may a pinch of Cabbage seed, Raddish, Lettuce, or anything else you wish to have a few of, to chance coming a little earlier.

**RADDISHES.**—Sow on a warm border to be covered with litter against bad weather. Some sow lettuce and spinach amongst them, but I think it a slovenly plan, and would sooner take a part of the border for each.

**SPINACH.**—Sow a small portion of round leaved spinach every fortnight or three weeks, sow thinly, weed and thin winter Spinach to six or eight inches apart.

Sow **LETTUCES** of all sorts in the open border, to be covered with litter as a protection. At the end of the month you may plant out in a warm situation any that have stood the winter protected or otherwise.

**DANDELIONS** are a favourite winter salad, and these may be forced almost by a kitchen fire, collect the roots and plant them anywhere that you may cover them with a pot, and surround them with dung like Sea Kale, or plant some in a slight hot bed, and they come more green.

**SEA KALE.**—Force as before directed whenever a supply is wanted.

**CARROTS AND PARSNIPS, BEET, ONIONS, AND LEEKS.**—Sow a few at the beginning, and a few at the end of the month, a drill or two of each will be enough at this season.

**BEANS.**—Get in a few drills more beans to follow those which are forward, Marshall's early sort will be the best, or next to them, early Magazans. Those who want the larger kinds, but they are not so well adapted for a private family, nor is it right to sow too many although this is the season for a main crop.

**PEAS.**—Continue your sowings as directed before, every three weeks or twice a month, being careful not to overstock the garden with anything.

**HERBS OF ALL KINDS** required for use may be sown in any convenient place to be removed into beds at the proper season. Parsley should be sown in considerable quantity, nothing is so useful as a garnish, nor so sweet as a herb, many sow this herb round the edges of beds,

but it is better to have a quarter set apart for it, and sow it in drills.

**HORSE RADISH.**—Plant as before directed in page 17, vol. 1. I refer to it in preference to copying out a long article which I cannot improve. I object to dibbing in suckers or crowns but trench the ground eighteen inches deep, and place a row of sets every two spades apart, the sets are pieces of a root an inch long.

**TURNIPS.**—A few early Dutch may be sown at the end of the month.

All the ordinary duties in the kitchen-garden have of course to be attended to; treading, cleaning, covering against frost in the evenings, lining hot beds that are declining, &c., &c., &c.

#### FRUIT GARDEN.

Complete all pruning that has been left so long undone, and attend to previous directions on this head, so also planting, if there be any trees required, or those in one place have to be removed to another; refer to the past months for instructions on this subject, where the pruning and planting of Vines, Peaches, Plums, Apples, Pears, Gooseberries, Currants, and other trees, dwarf and standard have been fully treated of.

**STRAWBERRIES** may be planted if the proper time has been allowed to pass; let them be planted on a warm border in rows eighteen inches from one another, and the plants a foot apart in the row, or they may be fifteen inches apart every way. The best sorts are Myats' British Queen, Keens' Seedling, Swainston Seedling, Old Scarlet, and Elton. The ground should be well trenched and dunged, and when the plants are put in the earth, should be well closed about their roots; if dry weather follow they must be watered.

**TAKE STRAWBERRIES** into the forcing pit if you want a few, or you may plant a few strong plants in a hot bed to be covered with frame and light.

**GRAFTING.**—Look out for grafts of any thing you wish to place on trees, in preference to what they are at present; when you get them, put the large ends into the ground to keep them moist till you use them.

#### FLOWER GARDEN.

**AURICULAS** now require top dressing, that is, the surface soil, down to the fibres removed, and new compost applied. Take up the plants one by one, and with a bit of stick made rather flat, rounded a little at the point, or rather the end, and the sharp edges taken off, stir the surface, and throw out the loose

stuff, taking care that though you go down pretty well to the top fibre they be not damaged. Then take off decayed leaves, by pulling them edgewise, not stripping downwards, fill up the pot with the mould of cow dung, that is to say, cow dung rotted into mould; or, if you cannot get it, the next best thing is leaf mould, that is, leaves of trees rotted into mould. If any of the pots look too moist and feel heavy, turn out the ball, and most likely you will find the soil all filled in between the crocks, in which case the whole of them had better be carefully removed, and new ones put in their places, about the same height. The plant and ball may then be returned to the pot.

**TULIPS** must have all the air possible consistent with their perfect protection from frost. This, of course, enforces covering of nights, but if the weather be open, and not frosty, they ought not to be covered before dark, nor a moment after day break. Covering is better done with a waterproof cloth than a mat, and it should reach the ground when it freezes; transparent cloth, however thin, will keep off a great deal of frost, or rather, keep in a great deal of warmth.

**PANSIES**, particularly small ones, that have been in the open air should be examined, as they are frequently raised out of the ground by frost or worm casts. Those which have been earthed up, so as to leave only just their tops out, will have hardly been disturbed; towards the end of the month they may be top dressed, or the top dressing be adjusted. Nothing is better for this than the universal favourite of the florist, mould from decayed cow dung. What any of the new manures may do bye and bye, I know not, but seeing what can be done with this one article, I shall be very shy of trying experiments with any valuable flowers; those in pots should be examined, their dead leaves taken off, and unless wanted for their blooms, the flower buds should be picked.

**CARNATIONS AND PICCOTEES** must not yet be set growing, but continue to have plenty of air, little wet, no wind, except when warm, and, like all potted plants in pits or frames, they should be lifted and examined occasionally to see that no slugs, snails, or other vermin, hang about the pots or under them; the frame ought always to be dry at the bottom. Lose no time in ordering and selecting plants, though they may be kept for you till the end of March, if you do not wish to have them yet; the choice will get less the longer you delay.

**HYACINTHS IN POTS** may be continually taken into the forcing frame, a few at a time, to succeed each other in blooming. Those in

beds should be covered the same as Tulips, while patches on the border may have a little litter, or a large flower pot put over them whenever the weather threatens to be hard, though in a general way Hyacinths, and even the blooms when open will stand a little frost.

**ANEMONES**.—The double sort require protection, but the single ones planted in the autumn may take their chance.

**POLYANTHUSES** in open beds should be examined, for slugs and snails will harbour amongst them; the earth may be stirred between them, and damaged leaves be removed. Seed of Polyanthuses may be sown in pots, boxes, or seed pans, of light soil, composed of loam and dung, sifted through a moderately fine sieve, the seed should be sprinkled thinly over the surface when levelled, and a little mould sifted lightly on. Care must be taken not to allow the soil once to get thoroughly dry, for the seeds would in all probability lose their vitality, by drying after they begin to swell.

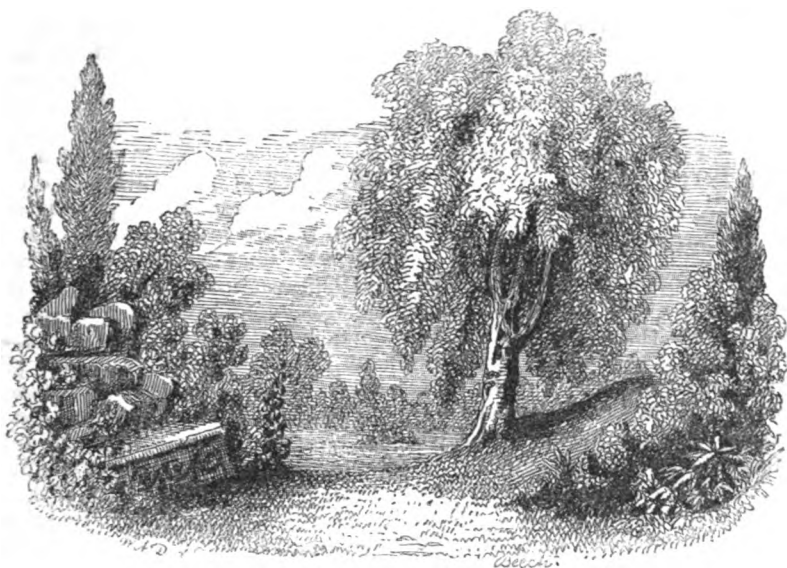
**TENDER ANNUALS**.—Sow in pots and place in a moderate hot bed, towards the end of the month, a few choice Balsams and Coxcombs, when up, prick them into small sixty sized pots, and let them remain in the bed; also a pinch of each of the popular annuals that are grown for shows, such as *Skysanthus* in variety, *Salpiglossus* in variety, Ice Plant, Egg Plant, &c., which treat in the same way.

**TEN WEEK STOCKS AND MIGNIONETTE** may be sown in small quantities to forward them.

**HARDY ANNUALS** may be sown at the end of the month in patches in the borders, in beds to plant out from, and in all places where they are to remain, but this is not the principal sowing.

**PLANT OUT** hardy herbaceous plants in the borders and beds where they are to bloom, unless you did so at

This month, *Ranunculuses* for the June shows must be planted. The beds must be composed of half good loam, and half decomposed cow-dung well mixed: the bed should be dug out a foot deep at the beginning of the month. The most enthusiastic florists leave the soil out of the bed in a ridge of each side of it, until the 12th, when they put a layer of neat's dung two inches thick at bottom, all over, then return the soil to the bed, leave it to settle till the 14th, when they level it, draw drills three inches deep, and six inches apart, the roots are gently pressed into the earth at the bottom of the drill; cover the roots an inch and a half above the crown by drawing down some of the mould into the drill.



## ARBORICULTURAL ILLUSTRATIONS.

## No. 1, BEECH.

FEW of our timber trees are more useful than the Beech. The masts, as they are called, or nuts, which are the seed, are edible, and the wood is hard and durable, convertible into everything requiring a close texture and hard wear. Hence for turners, millwrights, joiners, and the manufacturers of bedsteads, work benches, and a thousand other articles, it is one of the most useful woods they have. The Botanical name is *Fagus*, from Phago, to eat, for the nuts were of old used for food. Few trees are more handsome or ornamental, and

*Fagus Sylvatica* is frequently planted as single specimens on lawns, in parks, and park-like domains. It grows well in loamy soil or chalky clay, and best on the south and south-west side of a hill, or rising ground, or any sheltered spot. The varieties are, *Antarctica*, *Betuloides*, *Ferruginea*, *Atrorubens* and *Incisa*, but *Sylvatica* is the kind planted for timber. It is raised from its masts or nuts which ripen in moderate seasons. It is also propagated by grafting or budding.

M.

## THE HEPATICA.

HEPATICA, THE DOUBLE WHITE.—I am delighted to observe that you have at length taken some notice of my favourite little flower, the Hepatica. Not only from associations, (which it is not necessary for me to narrate,) but on account of the innocency, and innate beauty of this early visitor. I have become attached to it in no ordinary degree. I have on my lawn a few of the small beds or clumps, near the house, thickly planted with the varieties; amongst them I place a few snowdrops and crocuses, and in February and March the effect is really beautiful. When they are gone, the same beds are filled with annuals for the summer. I observe that you moot the question of the "*Double White*." On this point I made an inquiry of you some eighteen months or two years ago, but without obtaining a reply. However as you have now brought this plant before your readers, you may feel disposed

to hearken to what I have got to state. You appear to doubt its existence, but I beg to say, *that I had one*, and that it bloomed two or three years successively, and at the regular season. It was a pure white, large, and very double; but where I got it, I cannot make out, for I am in the habit of buying plants at any place where my fancy is taken. About four years ago I removed from my then residence to my present, and employed a job gardener. It was the first time I had employed him, but he had worked in my neighbour's garden, and observed, no doubt with a gardener's eye, my double White Hepatica, for he very soon began to make most affectionate enquiries after it. I took it with me amongst the rest, and he had the replanting of the whole of my flowers, but my double White Hepatica never again made its appearance. He either took it away, or it died—I cannot positively say which, but a few

years may show, for I have got him in view. I had not the slightest idea of its value, otherwise I should have taken much more care of it than I did. I had a number of *Hepatica* roots sent up from the north, and can only suppose that it came up amongst them.

AN AMATEUR AND SUBSCRIBER.  
*January 15th, 1844.*

#### GERANIUMS.

It is as much our province to correct bad habits in showing, as to form good ones; and as we have always been an advocate for exhibiting plants as nearly to their natural growth as possible, we have observed with regret every departure from it by means of artificial growing or training. In the culture of geraniums we are getting into an awkward extreme: instead of plants which will support themselves, we have scrambling bushes which require a bundle of laths to keep them in anything like order; and the entire art is in the mechanical and not the horticultural construction of the plants. That these form very fine objects, and exhibit vast mechanical taste and skill is true enough; but we want to see a plant with its single stem supporting a bushy noble head, blooming naturally at the end of every branch, unaided by a bundle of upright sticks, which destroy the symmetry of the object, and are always offensive to the eye. We do not wish to deprive the geranium manufacturers of their enjoyment; we do not desire to prevent everybody who likes it from indulging in their fancy; but the gardeners ought to be encouraged in growing plants without half the sacrifice of time and labour that is now necessarily bestowed on this estimable subject. The evils attending this mode of culture are numerous, but the following are prominent:—First, it causes an immense sacrifice of time, apart from the management and growth; secondly, it tolerates a miserable sickly habit, which would not be at all permitted were it required that plants should support themselves. Now these evils can be well understood. The first is serious in more ways than one: people see those immense plants exhibited, and fancy their gardeners ought to produce the like, whereas a man who adopts such a mode of growing should have more hands than any ordinary people will allow, and therefore, though perfectly able to produce the growth, could never find the time to be everlastingly tying them. The second evil, that of engendering a carelessness as to the habit of a plant, is much greater than the first; one half the fine looking specimens, which make such a show while there is a stick and half a dozen ties to every stem, would, if not so supported, be totally

unfit to look at. As well might people show auriculas with a stake to support their stems, as to show Geraniums which require support in the extraordinary way now adopted. It should be recollected that all plants but climbers should support themselves; that, although it is desirable to tie them up for travelling, and to put a stick to the main stems to prevent accident, that plant is best grown which requires least assistance. It is a question with us whether there are not in cultivation geraniums which could not grow handsome, geraniums whose branches could not stand up without support; and if so, it is a very injurious system to exhibit plants in a way to hide so fatal an imperfection.

We throw this out for the purpose of calling the attention of societies to the necessity of awarding prizes carefully to seedlings. Let attention be paid to the habit of the plant; for no flower will compensate for the spindly stalky specimens which we occasionally see, and which can never become an acquisition to the general collection, on account of the weakness and raggedness of their growth; for the idea of tying up a collection of plants, as they are tied up, doctored, and trimmed for shows in general, is absurd. A splendid large plant should support itself; and if we had our will, no plant should receive a prize that did not exhibit its single stem above the pot, and carry its branches well without so much artificial training. People want plants that will hold their own weight; for not one in twenty can afford to keep men tying up from morning till night the spindle-shanked things, which, in too many instances, have become favourites.

#### ON FORCING KIDNEY BEANS.

BY MR. W. P. AYRES.

THE forcing of Kidney Beans being one of those simple operations of gardening which are generally considered easy of accomplishment, it will almost appear unnecessary to take up the time of the association by its discussion; but as I happen to be one of those who think that many of what are considered simple operations are capable of being much simplified, I venture to throw out a few suggestions on the subject, with the hope that they will not be considered unworthy of notice.

The general manner of procedure in forcing Kidney Beans, as practised by many of the metropolitan commercial growers, and recommended by the "Encyclopædia of Gardening," and some of the periodicals, is to sow a quantity in forty-eight sized pots, which are planted into larger pots (twenty-fours or sixteens) when they are three or four inches high.

Another plan is to sow a quantity in shallow pans or boxes, to divide and plant them into large pots when they are two inches high.

Now, for my own part, I never could see the necessity for, or utility of, this sowing and then planting, and have frequently asked what advantages are derived from the practice, but I must own, without eliciting any satisfactory solution of my question. It is true there will be a saving of room by using small pots, but this can only be for a few days; and when it is recollected that light is not necessary to the first processes of vegetation, the question naturally presents itself—why may not the Beans be sown at once in their permanent pots, and the pots placed in situations where other plants will not grow, as under the trellis in a peach house, or under stove plants, until it is necessary to bring them to the light? I am aware that this is the practice of some gardeners, but I have reason to believe that the system is not so well; at any rate, it is not so generally practised as its superiority and simplicity entitle it to be. Hence my reason for calling attention to it at this time.

The following is the routine of culture necessary to give a regular supply from October until they may be gathered from the open ground in May:—

About the 1st of September a quantity of soil, consisting of old cucumber or melon mould, rotten dung, and leaf mould, in about equal proportions, having been prepared and laid in a dry shed, a number of pots (say five dozen) of the size called wide-mouthed twenty-fours, are crocked, and filled to within three inches of the rim. They are then placed in any convenient part of the forcing house for a few days, until the soil is warm. The Beans are then sown, about ten or twelve in each pot, and pressed by the finger about one inch below the surface of the soil. In a week they will be up; they must then be thinned out according to the strength of the plants, to six or eight in each pot, and receive a gentle watering. As soon as the two first leaves are fully developed, the plants must be earthed up as high as the cotyledons, taking care at the same time to divide the plants equally over the pots. After this the plants must be regularly syringed and watered at the roots, but care must be taken, especially in the dark winter months, that they do not become too wet, or they will damp off.

When the plants have made two joints they must be stopped, which will cause them to make lateral and bearing branches. As soon as they begin to swell the legume, which will generally be in about six weeks after sowing, they must be watered once or twice a-week with liquid manure, formed by putting one

peck of pigeon-dung into a hogshead of soft water. It must be used in its most limpid state. To keep up a regular supply, say of six hundred per week, a complement of five dozen pots must be put in every twenty-four days until the 1st of April. From the 1st of February larger pots (sixteens) must be used, and the soil should have a little fresh loam added to make it more retentive of moisture.

It is hardly necessary for me to refer to the importance of light, as every gardener will take every advantage of it that he can, especially in the dark months of winter, by placing the plants as close to the glass as possible. As respects temperature, unless there is a house set apart for them, the Beans must succumb to whatever is considered necessary for the other inhabitants of the houses; but if it can be so arranged, I should recommend a night temperature of from 55 to 65 degs., to rise to 70 degs., by fire heat, through the day, and to 80 or 90 degs. with every sunburst. The plants must be syringed at every opportunity, that is, on every clear or sunny day; but when that cannot be done, the house must be kept as humid as possible, by throwing water on the paths, pipes, flues, &c.

Of the kinds best adapted for forcing, perhaps the pink speckled or Chinese dwarf and the dun dwarf are the best. I have, however, forced several others, that are quite as prolific as the above, but not so fine as the legume, hence I recommend the above.

Of insects which attack the Bean, the red spider, and that jumping little pest the *thrip*, are the most injurious; neither of them, however, will do much injury, if syringing is properly attended to; but should they get 'a-head,' the spider may be quickly subdued by syringing with water impregnated with sulphur, and the thrip may be routed by a strong fumigation of tobacco, or by syringing the plants with soap-water.

Kidney Beans require to be gathered every day. They are best preserved by laying them on a cold cellar floor. The old system of laying them in water I do not approve of, as I think it injurious to the flavour of the Bean.—*Read before the West London Association for Mutual Instruction.*

#### CULTURE OF PARSNIPS.

THIS plant is much better suited for agricultural purposes than the carrot, it being more productive, and growing more freely on a greater variety of soils; it will do well on most soils that are not stony, but a clay or strong loamy soil appears best adapted for it; on these soils from 453 to 500 bushels are frequently grown. The land that this root is intended

to be grown on should be ploughed as deeply as possible, or trenched in the autumn, and as early in the spring as the season will allow, it should be well dressed, down and cross ploughed, at the same time ploughing in from fourteen to sixteen cart-loads of good rotten dung per acre, then well scarify, harrow, and pulverise the land, and sow the seed in the latter end of March, or beginning of April, but be certain that the seed is of the last year's growth, as, if kept over the year, it frequently will not vegetate. It may be sown broadcast, drilled on the surface, or drilled on the ridges, as in the Northumberland system of growing turnips, and the manure then deposited in the same way. The latter plan is to be preferred, as the Parsnip requires a considerable depth of soil, and by this means a greater depth is given. The distance between the rows should be from twenty to twenty-four inches, and in about ten days or a fortnight after the plants make their appearance they should be hoed, and in about a fortnight after set out for the crop, from ten to twelve inches apart. If on the ridge, much care should be taken not to hoe the earth from them, and once or twice during the summer the earth should be drawn up to them, as the root should not be exposed to the sun and air. As this is a very hardy plant, and whilst standing in the ground will bear the most severe frost without injury, it is not necessary to dig them up to preserve them, as carrots, potatoes, &c., but they may be dug up as they are wanted for use; yet it would be well always to dig up a portion of the crop the latter end of October or beginning of November, because if a severe frost should set in, it will be impossible to take them up at that time. Those that are dug up in the autumn should be laid in a heap in a barn or shed, and covered with sand, but the whole of the crop should be taken up in the beginning of February; for as soon as the flower stalks begin to form, the roots become hard, and lose their quality. Parsnips are excellent food for all kinds of stock, and there are none but will eat of them freely. For milch cows they are to be preferred to mangel wurzel, carrots, or turnips, the latter of which gives an unpleasant flavour to milk and butter, which is often so rank and bad as to be almost unfit for use, but the Parsnip gives a peculiarly good flavour and richness to them, and are quite as good as when the cows are feeding on the sweetest pasture. They may be given to neat cattle whole, but for horses they should be cut and mixed with chaff, they should also be cut for sheep. In the Isles of Jersey and Guernsey the Parsnip is extensively cultivated for milch cows, and much of the butter produced from them is sent to Southampton and

Portsmouth, which in the winter is far superior to any made in England. At that season of the year, Mr. Carr, an eminent agriculturist, near Warminster, has cultivated and fed stock more on this root than any agriculturist known of in this country, and he speaks very highly of them as food for all kinds of stock. There are several varieties, but those best adapted for field growth are the Guernsey, if on a deep soil, as they frequently grow from two and a half to three feet long; but on a soil of less depth the hollow crowned will be best suited.

#### REPTON, THE LANDSCAPE GARDENER.

PERHAPS there is no stronger proof of Mr. Repton's love for the beauties of nature, than the wish he had latterly expressed, that his remains might be deposited in a "garden of roses." To gratify this innocent fancy, he himself selected the small enclosure on the south side of the picturesque church of Aylsham, in Norfolk: a simple gothic monument records his name and age, followed by some lines written by himself:—

"The tomb of Humphrey Repton, who died March 24th, 1818.

'Not like the Egyptian tyrants—consecrate,  
Unmixt with others shall my dust remain;  
But mouldering, blended, melting into earth,  
Mine shall give form and colour to the rose;  
And while its vivid blossoms cheer mankind,  
Its perfum'd odour shall ascend to heaven.'

In the same grave reposes that gentle being, who, for five-and-forty years, had been the beloved participator in all his joys and griefs: she did not long survive him; and it was her last request that they should not be separated in death. Out of a family of sixteen children, but seven reached the age of manhood; and at their parents' death only four sons and a daughter remained of this numerous family. The latter still resides with her eldest brother, John Adey, who is, perhaps, less known as a follower of his father in the art of landscape gardening, than of one deeply versed in antiquarian lore; from which peculiar taste he has gathered an accurate knowledge of ancient gothic architecture, many specimens of which are to be found in the engravings that accompany his father's works. The second son, Edward, who was originally intended for his father's profession, having evinced a preference for the church, was sent to Magdalen College, Oxford, and is now a Prebendary of Westminster. The third son, William, is in the law, and possesses the small paternal estate at Aylsham; and the fourth son, George Stanley, who has for many years practised as an architect, married the eldest daughter of the late Lord Chancellor Eldon, only a few months previous to the death

of his father. One of the most ardent wishes of that father's heart was gratified, by living to see his children united and happy: and we cannot better close this notice, than by transcribing his own concluding words, so expressive of the ruling feeling of his mind:—"My ship of life is sinking, and it is time to quit it; these pages will serve to show how actively I have performed the voyage—how I have glided through calms, and struggled through tempests. I have touched at every port, and where have we met with happiness unalloyed? or where found a man not disappointed? Nowhere! Yet still I must repeat, that there is more of good than of evil; and for this redundancy, all our gratitude must, at last, resolve itself into that reiterated aspiration from my heart—*Laus Deo.*"

J. B.

#### METHOD OF PRUNING AND TRAINING STANDARD APPLE-TREES.

*Printed for distribution, by the Author.*

At the request of the Committee of the Whitehaven Horticultural Society, I submit to your consideration an account of the method of pruning and training the standard Apple trees in the Earl of Lonsdale's Gardens, at Whitehaven Castle, during the last seventeen years.

I have frequently been very much surprised, when travelling for the purpose of seeing the gardens of different noblemen and gentlemen, to find so little attention paid to standard apple and pear trees; two objects, when under proper and judicious management, the most ornamental and useful of any to be found in a garden.

The common practice of treating standard fruit trees, even by experienced gardeners, is to head them down the first year they are planted, because they think the roots have been injured in taking up, in such a manner that they cannot support the whole of last year's wood; after that the tree is left to grow at will, any further than when a branch or limb becomes too large and spreading as to interfere with another tree, or some walk or foot path, then an axe, a bill, or saw is taken, and the encumbering limb or branch is amputated.

The practice of pruning which I am going briefly to explain, I have not seen practised by any person, except by Mr. Barnet, gardener at the Experimental Gardens, Edinburgh, about seven years ago. Upwards of seventeen years ago, when I came to the Castle Gardens, Whitehaven, under Mr. John Pennyfeather, I found some standard Apple trees about two years planted, and Mr. P. put them under my management. This gave me

an opportunity of following out the system of pruning first adopted by me in the Isle of Man, about twenty-five years ago, where I commenced upon a piece of ground (five acres) at Ballaquinney More, Kirk Marowne, as an orchard and nursery, all planted with standard apple and pear trees, at the distance of seven yards by five, with very little protection from any wind. It then appeared to me that the nearer the ground I kept my trees, after I had got them into a bearing state, the more likely I should be to obtain a crop; this idea induced me to form the system of pruning which I have followed ever since.

My season for pruning commences as soon as the fruit is taken off the trees, and continues to the middle of March; during that time I cut out all the ill placed shoots, such as incline to grow towards the centre, or into each other, and I leave untouched all those that stand in such a way that the tree will form a cup, or something like a well blown tulip, all the branches standing perfectly clear of each other, so that they will bear as much fruit on the inside as on the outside, the sun and air getting to all parts of the tree alike. The great object in this windy part of the kingdom is to keep fruit trees as low as possible; this may be done by removing a limb when it is likely to get over tall, leaving a young shoot at a proper place to succeed it, and by taking out a fourth or a fifth of the old wood every year; in this way your trees will always have the appearance of being under twenty years of age. Having finished winter pruning, the next thing to be done is the shortening of the last year's wood. This is an operation of great importance, so much depending upon the nature of the season, as to whether the eyes will form wood or fruit spurs; and even the most experienced will sometimes err. To give a person a just idea how to shorten the last year's wood without some practical lessons will be rather difficult, I shall therefore make choice of three trees of different modes of growth.

The first, a weakly growing tree, whose extreme shoots seldom or never exceed fifteen inches of growth in one season, such as the Manx Codlin and Hawthorndean, two trees that agree very well with my method of pruning.

Second. Trees whose extreme young wood is from eighteen to twenty-two inches, as the Keswick Codlin, Greenup Pippin, &c.

Third. Trees of most luxuriant growth, making two feet and upwards of young wood in one season, as the Tiffin Apple, Tankard, Leadington, &c.

The main object is to cut those trees of different growths, so that the whole of the branches will be furnished with fruit-bearing spurs from

the stem of the tree, (which should not be more than three feet high,) to the top of the last year but one of its growth; this is effected by topping or shortening the last year's wood to proper lengths. The first, or weakly growing trees, I shorten to eight or nine inches, that is, leaving a little more than one half, or just as the eyes may be of strength. The second, of middle growth, I shorten to twelve or fourteen inches, that is, leaving about two-thirds, or as the wood may have a healthy, strong, and well filled eye. The third, and last, is a kind of tree very difficult to manage in warm droppy seasons, but at all risks I shorten to about sixteen or seventeen inches, that is, leaving about three-fourths. The object of this topping or shortening of the young wood is simply this, if the young wood be left at full length, which is commonly the case (if not shortened by the frost, and this frequently happens), that portion, which I cut off, becomes the most fruitful part of the tree, and leaves the lower part of last year's wood naked and barren, the extreme buds breaking more freely gives full vent to the sap, so that the lower buds neither break into laterals nor fruit spurs; consequently, there is of the three different growths of trees, one-half, two-thirds, or three-fourths of every succeeding year's wood unfruitful; the tree gets up to a great height, and only bears its fruit upon the outside and extremity of large naked limbs or branches, and it cannot be gathered by hand, but the tree must be shaken, which renders the fruit, although of the best quality, fit only for immediate use, or sending to market. According to my method of pruning, a tree may be kept at the height of from twelve to fifteen feet for twenty-one years in full bearing, and after that, headed over it becomes a new tree again.

The next thing is, at what time is the topping or shortening to be performed?

I alluded before to Mr. Barnet, of the Experimental Gardens, Edinburgh, as the only person I ever met with who had any idea of this system, and he topped or shortened all at the time of winter pruning; this is frequently attended with bad effects; in some seasons the young wood is not well ripened or matured, so that when the knife is applied to the place you wish the extreme eye to break from, it frequently happens that one eye dies from the severity of the weather, this leaves a dead horn, which is one year before it decays off, and is often the cause of canker. The season that I shorten last year's young wood is in April, and sometimes as late as May. I never shorten until the tree begins to grow, that is when the sap has begun to fill up the buds at the top of the tree; this is known by the buds becoming crimson, or of a rose colour, and a little swelled,

always choosing to cut above a bud on the outside, placing the back of the knife towards the centre of the tree, and cutting upwards in a slanting direction about half an inch above the eye. The difference of trees with respect to the time of breaking their buds is a full fortnight, which gives plenty of time for one person to go through a large orchard. It will frequently happen that instead of only the extreme bud breaking into wood, three, or sometimes four, will break; in this case, at next winter's pruning, I shorten all such down to two eyes, unless there be a branch wanted to fill up a vacancy. I then choose one well placed, and shorten it at the same time as the extreme shoot, only a little shorter; my reason for this is, if this and the extreme shoot were stopped both of a length, the sap would flow more freely to the top of the tree, the buds would break there more regularly, and the second shoot would only break about two-thirds or three-fourths of its length, and leave a portion at the lower end naked and unfruitful.

The above method of pruning is only applicable to Apple trees. Pear trees I treat in quite a different way; but, as the treatment of the Apple was only requested, I conclude with this imperfect sketch of it.

JAMES CLARKE.

*Whitehaven Castle Gardens, Cumberland.*

#### THE BOTANIST'S PLAGUE.

It is very hard that we no sooner have a new species of some flowers than the Florists set to work to upset it. We have said that several species of *Dahlia*, figured and talked of by Botanists, are no more species than the varieties raised from a pinch of seed are, but that nature is always busy with some flowers, and producing her seedling varieties in their native country as we are in town. In the varieties produced here from seed, the height varies from one foot to ten, the leaves from very narrow to very broad, and of almost every form; the flower from the size of a half crown to that of a plate; the petals from five to a hundred, and the form from narrow, long, and pointed, to short, broad, and obtuse. In short, there is no longer a peculiarity in the (so called) species which we have not in the seedlings raised here, nor do the said species from abroad make the least objection to fertilize with the varieties raised at home. Let us instance the following account of *Dahlia Glabrata*, it shows how much a little variety and that of an unimportant kind in leaf, stalk, or other part will entitle a new plant to the name of a species.

*DAHLIA GLABRATA*, SMOOTH DWARF *DAHLIA*.—*Syngenesia Polygamia*. Natural order



Asteraceæ, or Compositæ, Asteroideæ Eclipteæ, DC. *Dahlia*. *Botanical Register*, vol. i. fol. 55.

A native of Mexico, whence its seeds were obtained by George Frederick Dickson, Esq. who presented them to the Horticultural Society; they were marked *Dahlia* sp.—sub-frigid districts—with lilac flowers.

It is evidently different from *D. scapigera*, a new species from the same country, in its bipinnate leaves and branching habit; and also from *D. Barkeriæ*, another of very recent introduction, in its smoothness and its fistular stem; nor does it appear probable that it should be a mere variety of *D. variabilis*, whose endless offspring have filled the gardens with gay autumnal flowers. At least it appears to differ from that variable species, not only in its naturally dwarf habit and perfect smoothness, but also in its roots, which have fangs, slender and uniform in size, instead of being partly large and succulent, and partly resembling fibres.

There can be little doubt that this and *D. scapigera* will give birth to quite a new race of garden *Dahlia*s, in which dwarfness, so much to be desired, will not be an accidental deviation from a natural tendency to acquire a lofty stature, but will be a fixed habit, which may possibly, and, indeed, probably increase, till varieties shall have been secured, whose height, when in full flower, will not exceed a foot.

In its present state this pretty plant grows about three feet high, and requires the same management as the common *Dahlia*. It flowers from the end of July, until destroyed by the frost in autumn.

It answers remarkably well if treated as a half-hardy annual, which is by far the easiest and best way to grow it: as by saving the seed every season, there is no necessity for preserving the old roots, which are like those of the common *Dahlia*, but much slenderer.—*Register*.

These distinctions are well worth noticing, particularly as those who raise seedlings can manufacture them wholesale.

#### THE LATE MR. LOUDON.

OUR readers will remember our appeal in behalf of this gentleman, while he was alive to witness the estimation in which his labours were held, and they will readily call to mind the abrupt termination of the subscription which was opened on that occasion; in consequence, as we cannot help thinking of some ill advised interference, or advice which we did not think worth enquiring into. Facts which we were then fully cognizant of

have since been made public in this work, and the plain truth is that he who had performed herculean labours in literature with indomitable zeal and perseverance for the benefit of the gardening world, and become the owner of works which are invaluable, has died with his literary property so involved as to be unproductive to his widow and family, and that the work which might have been done in his life time and lessened the anxiety which preyed upon his frame has now all to be done. A meeting of the gardeners in the Regents' Park Society for Mutual Improvement, with Mr. Marnock in the chair, has been making a beginning by preparing the way for a more extensive assemblage. This demonstration has caused another by the Horticultural Society, and we know that at Plymouth, where Mr. Pontey, the chief nurseryman in that neighbourhood is moving in the cause, there will be a hundred pounds subscribed in a very short time. It has been recommended in the "Gazette," that as forty shares of 5*s.* each will buy a copy of the *Arboretum Britannicum*, such schemes should be open every where. The forty people may be entitled to read it in turn, and a lottery at the end of the year might decide whose property it should be. This done by gardeners, and the gentry who have libraries should make a point of adding this work to it; the entire stock would be taken in a single week, and all the other literary property be redeemed. However, our columns will be open in aid of the cause in all the forms it may take, and if publicity will serve the various undertakings, we shall aid as much as any portion of the press.

#### PINE GROWING.

WHILE the Horticultural world are up in arms about growing the Pine Apple, and sundry head gardeners are squabbling about whose shall be pronounced the best system; we take leave to recommend without any qualification the system of Mr. Glendinning, now of Turnham Green to the general notice of those interested in the culture of that aristocratic fruit. The perusal of his treatise, published years ago, will be rewarded by an acquisition of truly useful knowledge, and the plain and familiar style of the writer, the practical nature of his instructions, and the unassuming tone throughout, have rendered the most popular treatise extant. We take only one chapter by way of example:—

#### CULTURE OF THE PINE-APPLE.

For a family requiring a moderate supply, the sorts I would recommend are the following, in the proportion of about two-thirds of

the Queen and Ripley's Queen, and the other part Black Jamaica, St. Vincent, Otaheite, Russian Globe, Black Antigua, and two or three Providence and Trinidad. The Envilles, and some of the Sugar-loaf kinds, although handsome, are generally very inferior in flavour; there are I believe a few other good sorts which have not fallen to my lot to prove. The White Providence and Trinidad can only be recommended for their large size. The black kinds are very suitable for winter fruiting, although I have at that season brought the Queen Pine to a high degree of flavour. In respect to any preference being given to the crown or the sucker, I invariably select the largest and stiffest, without any regard to that particular.

All plants under artificial care, but more particularly those of a fruit-bearing kind, assume peculiar habits, according to the nature of the *soil* in which they are planted, and their tendency to fruitfulness is governed in an extraordinary degree, by the texture and composition of this fundamental element of vegetable life. This observation will more particularly apply to the Pine-plant, than to any other cultivated for its fruit, with which I am familiar; with soil and treatment calculated to produce such a disposition, the healthy, yet inflexible appearance of such plants is singularly imposing. The under leaves take an horizontal direction, and the others to the centre gradually less so; they will, according to their length, be proportionally broad, and sufficiently robust to resist injury from carrying and potting; the foliage will radiate from the surface of the soil, neither showing a naked stem, nor too much sunk in the pot, with a stem of relative strength, the general character rigid, and of a dark green powdery hue. Therefore, as much depends on the compost employed, I hope I shall not be subject to the accusation of prolixity, when treating rather minutely this part of my Essay.

Having experimented on various kinds of soil, from a very light friable loam, to that approaching nearly to a clay, my opinion is decidedly favourable to stiff soil; and in forming a proper composition, my experiments with manures have been equally varied; after numerous trials, I use the following compost, both because it is easily procured, and soon prepared; and after years of experience, it has been accompanied with the most satisfactory results, which no consecutive experiment has induced me to forego.

The soil which prevails in this locality is of a very free sandy nature; hence the difficulty of procuring that of sufficient tenacity in which to cultivate the Pine plant. The

most unctuous spots on the common are preferred, and the surface about two inches thick only is taken; and this is either covered with long grass, furze, or heath. We have been very much perplexed to obtain it free from mineral impregnation, but by allowing this a little more exposition to the sun and air, I have never found any injurious effects result from it. Such soil is usually found on levels, in hollows, or low wet situations, and thus becomes soured and oxidised from the mineral springs.

Great objections have existed to the use of such soil, on the pretence that the mineral oxide is pernicious to vegetation. To the extent of what is generally found in earths, I do not think so; and conclude the injury arises more from the stagnant water which must at some time have remained upon, or most probably periodically overflowed the surface in winter, from "land springs," which in summer become dry. In consequence of this winter saturation the grass grows long, and the heat of the succeeding season, from this accumulation and combination of vegetable matter on argillaceous land, produces putrescent acetification, which can only be addulced and purified by being fully exposed to the action of the atmosphere in a healthy situation. Where soil can be procured sufficiently retentive from healthy situations, such as old pastures, the addulcing process may be dispensed with; and it may therefore be brought into immediate contact with the enriching material. Having brought into the compost ground a sufficient quantity of this turfy loam of the proper temperament, it will be necessary next to collect a quantity of fresh deer or sheep dung, and begin forming a square heap in layers, putting three barrows of dung to six of loam and one of leaf or vegetable mould, and continue putting the one after the other, until the heap is three feet high. No other preparation will be necessary, as it will be fit for use in three or four months, when, with a sharp spade it must be cut through the heap perpendicularly, and the largest pieces again chopped.

To those unaccustomed to such a prepared compost, it will seem a coarse inapplicable material, apparently inappropriate for the first exotic fruit. Yet, notwithstanding such presumptive appearance to the contrary, it will be found to suit in an admirable and superior manner; the strong roots will pass unobstructed through the mass of clods into the drainage. This soil will always be in a healthy condition, encouraging the protrusion of innumerable spongioles, fixing themselves immediately upon, and penetrating into, each individual lump, with a singular and most remarkable tenacity; radiating and diverging

in a thousand directions. It will also give a constitution of inflexibility to the plants, contradistinct from those grown in a lighter and mellow soil, which the practical cultivator is so anxious of attaining; for he knows full well they will generally exceed his most sanguine calculations.\*

Having been thus diffuse on the combination and texture of the necessary compost, I now approach another most important and especial part of practical Pine-growing—potting. Unless this is properly performed throughout the various stages of the plant's growth, success will be indeed limited. I have always held this as a paramount part of the work, requiring great care in its execution, for on this will depend their rapid or tardy progress, either securing a healthy or sickly complexion, by the appropriate or injudicious adaptation of the soil and drainage. Accurate arrangement of these will secure a healthy body in the pots, by preventing the earth from becoming excicated and indurated, or saturated and stagnant with sour viscid soil, which might have been so easily obviated by a little nicety in their allocation. The time when the Pine plant is in a fit condition to receive a larger pot, must always be determined by the progress the roots have made; let this on every occasion be the criterion, and on no account shift a plant into a larger pot, merely because it may be a general shifting, unless the roots have made sufficient progress to justify the act. Always guard against over potting, as the plant in this case would remain stationary; whereas, in a comparatively small pot, it would continue growing, if supplied with moisture. Accurately to define the various sizes of pots suitable for the Pine plant, from its first insertion to the period of fruiting, can only be done by the operator; but the increase of size ought never at any one shifting to be more than two inches on the diameter of the pot. It would be impossible to state how often they ought to be re-potted, or finally determine the capacity of the pot in which the plant will mature the fruit. They must be shifted as often as they require it; which operation must be resolved by the progress the roots make from time to time, until they attain a size to justify their removal to the fruiting house; when there, should they continue growing, they must still have larger pots,

until they show indications of fruiting; and even then, if the roots have extended through and completely enveloped the ball, a larger pot must be substituted.

That the pot may admit plenty of drainage, its diameter will be a good criterion for the depth, although this is deeper than they are usually manufactured. The drainage should be through pots broken not too fine: an abundance of these in almost every place will be in store; but should any deficiency arise, all those pots that are deformed, and too hard kiln-burnt, as well as those that are old and saturated, may be reduced to fragments for this purpose, as plants of any kind never succeed well in such pots, these must be of trivial moment compared to the health of the plants, the gain will be greater, and the result more satisfactory. Previous to commencing this operation, the soil and drainage must be properly arranged on the potting bench; the lumps of turfy loam on one side, and that which is a little finer on the other. If the plants are large, the work will be better accomplished by two persons than one. First place two large sherds side by side, over the bottom hole, then add at least an inch of drainage, and upon this place from two to three inches of the selected pieces of loam, then let the plant down upon this; when the assistant will take both his hands, and gently grasp the foliage (for it is a bad practice to tie up the plants), in order that the other may regularly fill up all round the ball with the finer soil, which he will be the better able to do, by using a flat and rather sharp pointed stick: when this is done, gently strike the pot two or three times upon the bench, and this will consolidate the whole properly; at each of the several shiftings, but more particularly the plants that have been disrooted, a few of the under leaves must be pulled off, that the roots may not be obstructed as they are emitted from the stem, and at all other times the surface of the ball removed, and the drainage carefully picked out from among the roots.

The practice of disrooting, at the vernal shifting, all those plants not intended to ripen their fruit in the course of the following summer, has been long and beneficially followed. Although the fruiting-house at this season may be perfectly full of established plants of different ages, care must be taken to provide for the vacancies continually occurring, by selecting some of the strongest and best plants, which, instead of being disrooted, must be removed into larger pots, which, with the additional stimulus given at this period, in conjunction with the increasing natural heat of the season, will abundantly enhance their size for this purpose. The remaining plants must have their

\* Note. Since the above was written, I have been kindly favoured, from H. Morton Dyer, Esq., Vice-president of the London Horticultural Society, with specimens of two sorts of soil, in which the pine plant luxuriates in the Bahamas; they are of a stiff light brown alumina, and that which is marked the best, is the least friable, and approaches to a perfect clay, quite confirmatory of my previous opinion, and agreeable to what has been here advanced.

balls entirely shaken off, and the old roots completely cut away: indeed at this season, there will be scarcely any other but old roots, especially in the Queen variety. With the black kinds, more care must be taken to retain all the fresh and growing spongioles, as they have not the same disposition to emit such a profusion of them as the Queen's. After having been thus denuded of their roots, they must be put into pots comparatively small to their size; the largest plants into pots seven inches in the diameter, and the smaller into those one, two, or three inches less; they must immediately afterwards be plunged into the tan bed, at distances sufficient to allow the foliage to take its natural position, which, at this important period, and even until they are removed into the fruiting-house, ought to be punctually attended to; for, when crowded together, the leaves assume a slender elongated form, and when moved for the purpose of re-potting, or turning the tan, they are unable to maintain their position in the pot; the slender foliage bends from its own gravity, and thus the plants are totally ruined: but by giving them space, the air is allowed to circulate freely among the plants, the leaves take their proper place, and become fortified to sustain, without injury, the necessary carrying and changing consequent on their cultivation.

In this way does Glendinning's treatise on the culture of the Pine Apple, go through every subject connected with the history and production of the fruit, and it should be in everybody's hands.

#### TO PREPARE A TREE FOR PLANTING.

THERE are two things to be prepared in planting of a tree, viz., the head and the root.

As to the head, there is but little mystery in ordering that, either in standard or dwarf trees; it being needful only to remember these two points.

First. As we prejudice a tree when we pluck it up, by weakening it thereby, and abating its vigour and activity for some time; so we must therefore disburthen its head, proportionable to the strength and activity we take from it by removing it to a new place, and retrenching some of its roots.

Secondly. We must be mindful to leave its body no higher than is convenient for the use the tree is designed for: some being to produce their effect very low, as dwarfs and wall trees, which must be kept pretty short; and others to produce theirs very high, as standards, which therefore must be left of a suitable height.

As to the roots, cut off all the fibres, as near as you can to the place from which they sprung;

unless it be a tree that is to be planted again the very moment it is plucked up, without leaving it the least time that may be out of the ground; otherwise the air turns all the young roots or fibres black, and consequently spoils them. But this can never be done, except we pull a tree up, and plant it again in another place in the same garden. And for the better preservation of it, we may take along with the root some of its former mould that hangs next about it; taking care in planting it, to place and spread out well that hairy or fibrous part.

As to those that have been taken up some time, the fibres being all taken away, we shall be the better able to see the bad ones, to take them quite off; and to discern the good ones to save them, and to regulate the cutting them their exact length; and when we find the roots of any tree a little or ought too much dried, they may be steeped seven hours in water before they are planted.

In speaking of good and bad roots, it may be thought, that the meaning of these is only such as are broken, or unbarked, rotten, or dry: but yet there is something of greater consequence, which is, that every nursery tree shoots out sometimes either all good roots, or bad ones, or both good ones and bad ones at the same time; which comes to pass as follows:—

A tree planted with the preparations recommended, if it takes, must shoot forth new ones, or else it dies; all its old roots being of no service to it: and of those new ones some are fair and thick, and some are feeble and small: but of these roots we are only to esteem those which are fresh and new, and well placed.

All these young ones are to be kept short, proportionable to their length; the longest in dwarfs, of what bigness soever it be, which is commonly not very big, never exceeding above eight or nine inches; nor much above a foot in standards. We may leave a great length to the roots of mulberries and almonds; because those of the first are very short, and those of the second dry and hard, and therefore will be in danger of perishing if they be cut too short.

After we have fixed the length of our biggest roots, the length of two, three, or four inches will serve for the lesser or feebler ones, proportionably to the bigness of each, the least always to be the shortest; for this is to be done contrary to the method of pruning branches.

One single rank or story of roots is enough; and two or three good roots, when they are well placed round the foot of the tree, are better than twenty middling ones.

## ROOT PRUNING IN PEAR TREES.

It is now about ten years since, in consequence of being much inconvenienced by the confusion in the names of new pears, I felt myself called upon to plant specimen trees of all the varieties I then possessed. But fearing that much ground would be wasted in the experiment, I kept my mind on the alert to arrest superabundant growth, and induce early fruitfulness; this I then thought could be best done by planting the trees in small square brick pits, leaving holes at the bottom for drainage. Plunging trees in large pots also occurred to me; but as I soon found these methods too expensive, I took advantage of a piece of shallow loamy soil, resting on a sub-stratum of very hard white clay, to carry out my ideas, for I calculated that the roots of the trees would not penetrate the clay, and that the soil on the surface might be made rich enough to support the trees without vigorous and unruly growth. However, I soon found that the roots of trees are not so easily kept within bounds, and that those of my Pear Trees in search of nutriment, not being able to enter the hard clay, were wandering far and wide, the branches also keeping pace with the roots, and growing much too rapidly for my calculations as to the space each tree ought to have occupied. I had previously remarked for many years that apple trees growing in a firm loamy soil in this nursery, if removed one or two years consecutively, which in nursery culture often occurs, acquired a stunted and prolific habit, making abundance of bloom buds, and bearing profusely. On examining these trees, I found they had no large feeding roots, but only a mass of fibres. I also found that if such trees were by accident planted near, or in, rich soil, comparatively large feeding roots were formed; they commenced growing with vigour, and their fruit-bearing propensities were proportionately diminished, their tufty, fibrous roots gradually disappearing. I mention this without endeavouring to draw any conclusion from it, as it is intended simply to state the progress of my ideas. It then occurred to me that if I could keep the roots of my Pear Trees in the same state by frequent removals, I should make them acquire the stunted and prolific habit I had so long observed in apples.\*

In attempting to remove my Pear Trees, a second thought occurred, that it would be less trouble to dig a trench round them, and cut all their roots at a certain distance from the

stem, and this completely fulfilled my anticipations. I have pruned radically for five seasons, and with the most satisfactory result.

Shoots of the Autumn Bon Chretien of last season's growth were only three or four inches long, the root having been pruned December, 1838. A tree in this state should have one, or even two years' rest, that is, its roots should not be again pruned till it makes shoots, six to eight inches long in one season.

The Passe Madeline, whose roots were pruned in December, 1838, has made no shoots, but is covered with blossom buds.

In the Vallee Franche the maximum of last year's shoots was four inches; this tree was arrested by root pruning in December, 1838, and is now covered with blossom buds.

The Autumn bergamot is well known to have supported the Herefordshire distich,

"He who plants pears,  
Plants for his heirs."

With root pruning it seems inclined to be as prolific as the new varieties. I may here mention that a Gansel's bergamot being pruned rather too harshly in December, 1838, bloomed most profusely last spring, and died in the summer.

In the winter, Nelis, the last season's growth was three inches; the tree is now covered with blossom buds.

In all these cases the shoots are in a state of perfection as regards prospective fruitfulness.

It now only remains for me to give some hints and directions as to the mode of operation. The best description of trees for what I may perhaps be allowed to call Garden Orchards, are half standards with round well-formed heads, the same trained *en quenouille*, and dwarfs in the usual bush fashion. For immediate effect these should be prepared by annual root pruning for one, two, or three years in the nursery, but if not so prepared, trees of the usual size and quality may be planted and suffered to remain two years undisturbed, unless the soil is rich and they make vigorous shoots the first season after planting (operations may then commence the first season): thus, supposing a tree to be planted in November or December, it may remain untouched two years from that period, and then, early in November, if possible, a circumferential trench ten inches from the stem of the tree and eighteen inches deep should be dug, and every root cut with a sharp spade, which should be introduced quite under the stem at about fifteen inches in depth, so as completely to intercept every perpendicular root. The treddle spade used in this part of Herefordshire is a very eligible instrument for this purpose, as the edge is steeled and very sharp. The following year, the third from

\* I think I may say that I knew a small and neglected quarter of Apple Trees, in my younger days, that were six to eight years stationary as regards growth, but perfectly healthy and bearing every year profusely, the soil a stiff loam.

planting, a trench may again be opened at fourteen inches from the stem, so as not to injure the fibrous roots of the preceding summer's growth, and the spade again used to cut all the circumferential and perpendicular roots that are getting out of bounds, the fourth year the same operation may be repeated at eighteen inches from the stem, and in all subsequent root pruning this distance from the stem must be kept; this will leave enough undisturbed earth round each tree to sustain as much fruit as ought to grow, for the object is to obtain a small prolific tree. I assume that in the course of years a perfect ball of fibrous roots will be formed, which will only require the occasional operation of a trench being dug and this ball of earth pared down to ascertain whether any large feeders are making their escape from it. But it must be borne in mind that this circular mass of soil will in a few years be exhausted, to remedy which, I have had left round each tree a slight depression in the soil, or in other words, the trench has not been quite filled in, this circular furrow I have had filled in with fresh night soil, and this has had a most excellent effect; any other liquid manure would undoubtedly be equally efficacious, but my soil was poor and I thought it required strong manure. As it did not come in contact with the roots no injury resulted from using such a powerful raw manure; there is perhaps no absolute necessity for liquid manuring, as common manure may be laid round each tree in the Autumn, and suffered to be washed in by the rains in winter and drawn in by the worms. In mentioning liquid manure I give the result of my own practice; the great end to attain seems, to use an agricultural phrase, to be able "to feed at home," that is to give the mass of spongioses enough nutriment in a small space, but not too much, so that a tree will make shoots about four inches long in one season, (for such I conceive ought to be the maximum of growth) and at the same time be able to produce abundance of blossom buds and fruit;\* on trees of many varieties of pears the former will be in too great abundance. I think removing a portion in early spring would be an improvement in Pear culture. I have not mentioned the necessity of pruning the branches of pear trees thus brought into early fruitfulness; all that is necessary is the occasional removal of a crowded branch, the fact being that root prun-

ning almost does away with the necessity of branch pruning. Sometimes, however, a root will escape the spade, and then in the following summer a vigorous shoot or two will make their appearance; these should be shortened in August to within four buds of their base, and the following Autumn the feeding root must be diligently searched for.

To prune roots with a spade may be thought a rough and ungardenlike operation, but to use a knife would be tedious. In defence of spade pruning I can only say that it seems to answer perfectly with my trees, and experience is generally a tolerable guide.

I have also practised root pruning on apple trees for two years, and have reason to hope for perfect success. Some trees have been arrested in a most extraordinary state of vigorous growth, making shoots from four to five feet in one season, they having been planted about five years. From plums and cherries I have reason to hope for the same results.

I have not mentioned the possibility of root pruning fruit trees of twenty or thirty years growth with advantage. Irregular amputation of the roots of fruit trees, too vigorous, is, I am aware, an old practice, but the regular and annual or biennial pruning of them, so as to keep a tree full of youth and vigour in a stationary and prolific state, has not that I am aware of been recommended by any known author, although it may have been practised. In urging its applicability to trees of twenty or thirty years growth, I must recommend caution; the circular trench should not be nearer to the stem than three feet, and only two thirds of the roots should be removed the first season, leaving one third as supports to the tree, so that it is not blown on one side by the wind; and these of course must be left where they will best give this support. But if, as is often the case in pears, the roots are nearly all perpendicular, the tree must be supported with stakes. The second year after these remaining roots may be cut, or if the tree is inclined to be vigorous, all of them, but if it gives symptoms of being checked in its growth too much, they may on the contrary all remain undisturbed for one or even two seasons.

I may perhaps be allowed to conclude this too long paper by stating that as the end of all gardening operations ought to be to give much in little space, root pruning of trees carried on systematically and regularly, seems to approach that desirable object, and I cannot help flattering myself that, by its means, complete collections of pears and other fruits may be grown advantageously, in comparatively small gardens.—*T. Rivers' Hort. Trans.*

\* In describing the Autumn Bon Chretien I referred to the necessity of an occasional cessation from root pruning. I may here repeat that while a tree makes but four inches of annual growth or less, its roots may remain untouched, as it then is or ought to be in a prolific state; but if it shows too much vigour, by making shoots in one summer six or eight inches in length, the following November the roots must be regularly operated upon.

## WINTERING OF THE CARNATION.

THE evils arising from keeping a stock badly through the winter, may not be calculated upon to the extent that it, in my opinion, affects a collection; for is it not reasonable to suppose, that if a large number of plants die under a certain treatment, the remainder must in some degree have felt it, and become weakened by it? and although they may exist and bloom, they will only produce the poor dwindling things called plants, that I in common with hundreds of other amateurs are in the habit of receiving about this period of the year from those who are termed first-rate growers;—and the chances are, that with the most skilful treatment, you lose one-half of them.

Many whose eye this will meet, have at various times and periods of the year seen my plants, and I think I am not going too far in saying, they have been astonished at the generally vigorous state of my stock. To my own mind, this is entirely accounted for by the manner they have been treated through the winter, and from being kept in sound hardy health, I am constantly repaid by crowded pots of splendid layers.

I have given a fair trial to several plans of keeping the plants, and as my stock was very extensive and strong, I felt desirous of trying the general methods. From Willmer, I learnt the following method, and with it I tried several hundred plants. It is the plan he commonly adopts, and in most winters, or at least, such winters as we have had of late years, it may answer very well; but for a winter such as that of 1836, the plan was evidently not suited.

After the layers are potted and struck, he prepares a bed of any required length; the sides and ends are boarded from nine to twelve inches high; at the bottom of this bed he puts cinders or rough ashes and levels to the top with sifted ashes; into this he plunges his pots, and makes an arch of hoops over the bed, and on this he keeps a covering of mats joined together with a pole, sewn in the ends of the mats on each side, which enables you to roll up the covering which rests on the top of the arch. During severe weather, or much rain, the mats are constantly kept down, and invariably so by night during the winter. I found my plants, with this treatment, do very well till some time after Christmas; but about that time, and previously, we had a long continuance of rain, snow and frost, and, do what you could, by extra mats, you could not help your plants being constantly damp, both in grass and roots; the consequence was, that the plants began to look bad, and the heart turned a pale sickly green, and if I had not removed them, I feel confident I should have

have lost half; but after a few weeks of better protection they partially recovered, but never looked like any other stock.

The plan recommended by Hogg I find to be equally inefficient in keeping plants in good health, frames or pits are perhaps more generally adopted than any other method for wintering; but these, by their very construction, prevent a proper circulation of air, and engender damp: and the evils resulting from this plan are soon manifested by the plants becoming spotted on the leaves, and an unhealthy cankered look about them, which, later in the spring, completely destroys them. Scores of times have I seen stocks thus wintered, that in the month of February appeared as though they had been syringed with aquafortis, although the greatest attention may have been paid to them; while I can give you my word, that out of my complete collection, except upon plants I had received in, I had not one at potting time with a cankered leaf upon it.

You are told to give all the air you can in a frame, by raising it from the ground, and keeping the lights off as much as possible; but how can this be done sufficiently in the midst of winter, or in long continued rains, snows, or severe frost? The top-lights you are compelled to keep on for protection, and most likely at the same time to cover your frame; and thus your plants may be kept for days together without receiving air, or, if any, in such a quantity as to be of no benefit to them.

In the cultivation of this and other flowers, I find a great portion of the interest—at least I can answer for myself—in the study of their proper treatment and habits; and it is quite as delightful to me to see plants in health and vigour, as it is to see them in bloom.

Now the Carnation is most assuredly a very hardy plant, and will endure in the open ground the most severe and worst winters; it is also a plant, of all others, delighting in a brisk, dry, free circulation of air. Thus convinced of its perfectly hardy nature, and seeing the evils resulting from nursing and confinement, I had three years ago a glazed roof erected, the width of which is eight feet, the length may of course be made as it may be convenient; this roof is supported by uprights, about eight feet high in front, and six at the back, perfectly open on all sides; the dimensions I adopted for reasons I will hereafter state; the front or higher part faced towards the south; from the back uprights, about four feet from the ground, I begin a series of shelves, wide enough to take a couple of pots, and graduate them to about three feet high, the lower shelf being as wide as convenient, by this means you have a complete command of your plants.

When the layers are taken off, I frame them for a week or ten days closely, or until they are well rooted; I then take them out and stage them; by this plan they are exposed to all weather, have all the air possible, at the same time they are protected from rain or snow, and are above the influence of the damps and dews which affect them when closer to the earth. I find my plants thus treated never affected by any cankered spots on the leaves, and always preserve a beautifully healthy green. In fine weather, all through the winter, I frequently syringe them, or water with a fine rose in the morning, whenever necessary; and during very severe weather, or from snow or sleet drifts, accompanied with frost, I always protect them, by nailing mats or canvass to the uprights all round the stage, which I remove the earliest moment the weather will permit; but, if you are compelled to keep them thus for any length of time, they will not suffer for want of air, or from damp and close confinement. Snow or rain, if suffered to come upon them and afterwards frozen, affects them seriously, and should therefore be carefully guarded against. Besides the utility of this method, the trouble saved is immense; with this you have no lifting up and down of your lights, no closing and unclosing of frames, no stooping or trouble in the regulation of your plants.

The glass covering I have described answers two purposes—that of wintering, and also blooming under. It is for this purpose that it has the elevation stated; others may find a greater convenience in a variation—that of course has nothing to do with the plan which I hold to be the best for wintering. All I would impress may be thus summed:—Place your plants under a glazed roof, perfectly open on all sides—a good aspect, and the shelves a proper height from the ground; attend to watering or syringing; and in very severe and continued frosts, or in drifts of snow or sleet, enclose the sides for a short time as before described. And I feel convinced that any cultivator will be fully compensated for the trouble or expense he may have been at.—*Communicated to Mr. Glenny by H. M. Bucknall, Esq.*

#### CUCUMBERS FROM CUTTINGS.

**CUCUMBERS FROM CUTTINGS.**—It very frequently occurs to most of us employed in the vegetable world, that some freak or effort of nature suggests to us some new mode of cultivation. Such was the case with myself some thirty years past; when looking over my frames at an early season of the year, after uncovering, it was my usual custom to

stop all the runners that had advanced more than one joint, pinching off the tops with my finger and thumb. Those tops, falling in a casual way among the leaves, I found to my surprise, a few mornings after, had formed roots. I therefore took the trouble of potting several of them into small-sized pots filled with rich leaf mould; and in the course of a week or ten days from that time I found my young plants advancing rapidly. I immediately commenced stopping them back to one joint, and removed them into larger-sized pots; and in the course of a fortnight or three weeks from this operation the plants had strengthened very much, and all of them showing fruit, all of which I pulled off, and continued my old method of stopping and shifting; that in the course of five or six weeks I had three as fine plants as could possibly have been produced from seed, breaking from all points, and showing fruit at every joint. I, therefore, prepared a two-light box for them, and had the satisfaction of cutting fine fruit from the end of April till the October following. My present method of cultivation differs little from the former practice, except in selecting cuttings, which I prefer from young plants, or as near home as may be. Cuttings intended for propagation ought to be allowed to advance three or four joints before cutting them back to a single eye, and inserting them singly into small-sized pots filled with good leaf mould, and placed in the front of some frame at work, where the degree of heat will average from 70 to 80 degrees. Cuttings thus treated, in a moist atmosphere, generally take root in four or five days; after which I treat them as aforesaid. With regard to Cucumber plants from cuttings, there is no great benefit derived from such practice. It is a system I should never recommend, except short of seed, and a wish to increase the stock of a new variety. Great attention is required for the first two months in stopping and thinning the fruit, cuttings being much more prolific than plants raised from seed, showing ten times more fruit than the plants are able to bring to maturity, that, without stopping and thinning, your plants will very soon be exhausted.

Impregnating or setting the young fruit of Cucumbers at an early season is worse than useless, and a sure method of obtaining bulged or unsightly fruit. I have no doubt but that a host of old and young gardeners will rise up against this doctrine. My answer to the unbelievers is, let them make a trial, from the month of February till the end of April, by setting all the most promising fruit in one box or light, and leaving other boxes or lights for nature to perform its own



functions; and they will soon be convinced of the mistaken idea. *Communicated to Mr. Glenny in 1840.*

#### CULTURE OF THE CELERY.

THE *Apium Graveolens* or original wild celery is found in pools and ditches in several places in Britain, although not particularly common. It has shining bright green leaves with furrowed stems, and the whole plant partakes of an acrid taste and disagreeable odour, especially when bruised. The plant is biennial or requires two years to perfect itself, the first year it springs from seed and produces a few radical leaves, and establishes a small fusiform and extremely ramified root, which is almost expended the following year in the perfection of its flowers and seeds, which is borne on loose and nearly sessile umbels. Whenever the seed is ripe and scattered, the plant dies, and its seeds vegetate the following spring. The whole varieties of celery in cultivation has been derived from the above by the assiduous exertions of the Gardener, and so far it is unlike the original species that it is only by the discrimination of Botanical science the identity can be proved. The object of cultivation is to produce the greatest possible quantity of radical or root leaves, without exciting what properly belongs to the second years development; and if it does arrive at this stage it is comparatively useless for salading or stewing in soups, as a great portion of the original acrimony returns which is completely banished by skilful practice. There is a certain time of cessation which the plant enjoys previous to their sending up flower-stems, or what is technically designated "running." This period of inaction may be induced by any untoward circumstance occurring in their growth, such as an overdrying, or a too sudden transition from heat to cold, &c. All these incidents may occur, either in the seed-bed or after they are finally planted out. Hence the necessity of never allowing celery to get too dry at any stage of its growth, and probably as much need for carefulness in getting it gradually inured to be able to accommodate itself immediately in the ground when it is finally planted out. For the main autumn and winter crops, seeds should be sown about the middle, or towards the end of February, in a light and finely sifted soil in pots or boxes, as the finer your soil the finer the roots will be, and less injured in removing, they may be placed in a Cucumber or Melon frame, which at that season generally admits of a few things round the "hills," they are to be gently watered and shaded from bright sun-

shine. After they have perfected two leaves they should be transplanted into boxes about three-fourths of an inch apart, the soil now used should be thoroughly rotten dung, likewise finely broken (for same reasons as is assigned above) and again placed in the warm bed. After they again begin to crowd each other they may be again transplanted into a bed prepared with about four inches of rotten manure placed on a hard bottom impermeable to the roots, they should have the advantage of a little heat to assist them in forming fresh roots with a covering of glass or any other transparent covering, taking the greatest care in watering at all times before they have become particularly dry, as the whole success depends on keeping the plants in a growing state from first to last. In this bed they may stand three inches apart in the line, with four inches betwixt the lines. About the middle of June they will be fit for finally committing to the trenches which ought to be properly prepared, they may stand five feet from centre to centre, with the excavation twenty inches wide and sixteen of depth, less space may in some instances be made available, but where large and fine crisp celery is the object, no less can be admitted. The trenches should get six inches deep of the richest and strongest manure at command. Nothing better adapted than cow dung, not particularly decomposed, as the richer the manure the quicker will be its growth, and on this particular depends its crispness and flavour, and more particularly its size. The spaces betwixt the trenches may be occupied with young lettuces, endive, raddishes, and other salading, so as they be fit for removing before the earth is required for the Celery. Little further attention is necessary until the plants are fit for "earthing up," only every attention is necessary as to watering in dry weather, and if manure water or soapsuds can be procured they may be advantageously applied. When they have advanced, so far as the leaves are endangered of breaking down, earth may be applied. A stake should be placed at the end of the row with a piece of bass attached of sufficient length to do the line, by carefully gathering all the leaves with the hand together, and twisting gently the bass round to keep the leaves together, pass on from plant to plant until the line is finished.\* A sufficient quantity of earth may be applied the first time by only raking the sides of the trench, as, little and often is the maxim which ought to prevail, the earth may afterwards be applied with

\* After the earth is applied the bass may be removed to tie up the next line, and so on till all is finished, always choosing the driest weather for the operation.

the spade and carefully pressed round the plant with the hand, leaving the "now hill" hollowed in the middle. The varieties most deserving of notice are the white solid stalked sorts, which is superior in point of flavour and crispness to the red or hollow stemmed varieties probably "Seymours Superb White" is among the best in cultivation. Celery is principally used as a sallad or stewed in soups, it is valued as an antiscorbutic in medicines and is a vegetable possessing many recommendations.

The distance between the plants in the line must be regulated by the size you wish to achieve, but it never should be placed any nearer than six inches, and if large stalks be the object, twelve inches may be requisite. The early crops may be planted thicker than those who are to be allowed to remain to acquire a large size. Always observe in earthing up to leave the heart of the plant wholly disengaged from the earth: if your dung is very strong and stimulating, you may mix it with a little earth by digging up the bottom of the trench. But if the dung be cool and well decomposed, you may only cover the dung in the trench by about an inch of soil on the surface. If the above directions be followed, the happiest results cannot but be realized. The sole accomplishment of obtaining fine flavoured crisp celery depends entirely on the quickness of its growth. Hence at all times a liberal allowance of the most stimulating manure at command, and a liberal supply of moisture, either water alone or in the shape of *liquid manure*.

#### F.

#### DESTRUCTION OF ANTS.

THOSE who are unfortunate enough to be plagued with these little pests in stoves, hotbeds, under peach or other fruit walls, have their patience tried not a little, for often are their best fruits spoiled, and when the insects swarm as they do in many situations, there is scarcely any end to the mischief. The following are some of the answers to the question, how are we to get rid of them?

Having been annoyed with ants for a considerable length of time in one of the hothouses, and all other means I could devise having failed, I adopted it, and the following which proved successful. I destroyed thousands of them daily, until I completely extirpated them altogether. I took a quantity of sugar and mixed it with water till it became like a syrup, adding half-a-glass of rum to a quart of it; I then put it into common sized garden flower-pot saucers, filling them about half full, and placing them at the roots and among the branch-

es of the plants most infested, at the same time cleaning them out and filling them afresh every morning. The consequence was, they got into the saucers, and were so fond of the ingredients that they immediately got drowned amongst them.—JAS. HAMILTON, Kentrough, Isle of Man.

Lay a beef or mutton bone at the bottom of the peach wall; let it lay for a few days until the ants have found it out, then, when you see it well covered, get a can of boiling water, pour it on them, and by repeating this a few weeks, you will only leave a few stragglers. By this method I have destroyed thousands of them in one day.—J. C., Felton Park, Northumberland.

By placing phial bottles containing small quantities of sugar and water, or any other very sweet liquid, near their haunts, he will speedily destroy an entire colony of those mischievous insects. The above is the most successful of a series of experiments which I have tried for the attainment of the object your correspondent has in view; and it first suggested to me the plan of protecting tender plants from the attacks of insects, by finding out other food for which they had a preference, and placing it in their way.—J. L., Salisbury.

Procure a quantity of fine sand, and throw to the depth of several inches over their dens, which are easily discovered. The insects cannot work in the sand, in consequence of the grains being so small and light as to give way under pressure of their feet. They will soon quit the spot. I have been much annoyed at seeing all my finest wall fruits go one after the other, and to notice the swarms of ants on the fruit. My impression is (founded on close observation), that what your correspondents fancy to be an indication of decay in the fruit, and that the ants attack those by choice which are so decaying, is, so far as the ants are concerned, caused by their feeding on the fruit, producing holes, which retain the rain, and thus produce decay. Apologising for trespassing thus long on your valuable time, I have the pleasure to have been, and to be, through good report and through evil report.—A SUBSCRIBER, Ely, Cambridgeshire.

#### SCIENTIFIC GATHERINGS IN THEORY AND PRACTICE

CINNAMON.—Cinnamon, a species of the laurel or bay tree. God commanded Moses (vide Exodus xxx., 22, 23) to take Cinnamon, &c., and make a perfumed oil, to anoint the tabernacle and the vessels belonging to it; beds were perfumed with Cinnamon, as appears from Proverbs vii., 17. Saints and their graces are likened to Cinnamon. Song of Solomon,

iv., 14. Cinnamon is a well known spice, it being a bark or rind that is sometimes exceeding thin, and sometimes thick, and rolled up into tubes or pipes of different lengths; the substance is ligneous and fibrous, but brittle, and the colour is of a yellowish red, with an acrid, pungent, pleasant, and agreeable taste, and a most delightful smell. It is the second and inward bark of a tree, called *Canella Zafanica*, a native of Arabia and Syria, it is commonly taken from trees that are three years old, in the spring or autumn; the ash-coloured outside is taken off, and it is then cut into pieces, and exposed, and while drying it rolls itself up in the manner it is brought to us. When the tree is stript of its bark, it continues naked for two or three years, and then another grows again, which serves for the same purpose. When it is distilled fresh, it yields plenty of oil, but when old and dry, very little; however, it is of two sorts, one of which sinks to the bottom of the water, and the other swims on the surface; this last is pale, but the former of a reddish yellow colour; they are both limpid, and of a most fragrant smell, and when tasted are very pungent. When the bark of the root is distilled, it yields an oil, with a volatile salt or camphire, which is lighter than water, limpid, yellowish, and soon flies away; it has a strong smell between camphire and cinnamon, and a very pungent taste. The camphire obtained from it is exceedingly white, and has a much finer smell than the common sort, but is extremely volatile, and takes fire immediately. The fruit of this tree is an oblong roundish berry, somewhat above the third of an inch long, smooth and green at first, but afterwards turns to a dusky blue, sprinkled with white specks; under the green pulp there is a thin brittle shell, containing a roundish kernel. Cinnamon is common in the island of Ceylon, where it grows in as great abundance as hazel trees with us. This valuable spice has lately been cultivated at Jamaica, with such success, that it is expected in a few years we shall, if necessary, be supplied with a sufficient quantity from our West India Islands.

**USE OF SOOT AS A MANURE.**—When spread early in the winter on meadow lands, the beneficial effects of this substance are frequently observable for three successive seasons, but when mixed with earth and dung its use is attended with even greater success; a sort of soapy earth is formed, which is beneficial to almost all kinds of plants, and its use quickens vegetation. The mixture should be formed of two parts of earth, one part of soot, and one of dung. A layer of earth should be covered with soot, over which a layer of dung should be placed, and thus alternate layers must be

arranged in a bed about three or four feet high, and three wide. Soot mixed with the earth dug from ditches, in the proportion of one-fourth, may, in about six months afterwards, be used with success in dressing meadows. Of this latter mixture, about thirty bushels should be used to the acre; spread on wet soils it will destroy the moss, and neutralize the bad qualities of the soil. Cattle are observed to prefer the grass grown on lands dressed with soot, which owes its valuable properties to the quantity of carbonate of ammonia which it contains, and which is a most active vegetable stimulant. On this subject we would remark, that soot, like many other articles, is even subject to sophistication by the unprincipled vender, who, mixing with it charred saw-dust, and many other carbonaceous substances, the refuse of many chemical operations, renders it comparatively inert and valueless.

**CULTIVATION OF THE CRANBERRY.**—In the *Transactions of the Horticultural Society*, Mr. Milne recommends the more extended cultivation of the cranberry. He observes, "I have been long convinced that both species may be grown with much advantage in numberless situations in this island, and have been surprised that cottagers and others living on or in the neighbourhood of moors and heaths, covered with soils suitable to their growth, have not been advised to cultivate them for profit." According to Witherington's quotation from Lightfoot, twenty or thirty pounds weight of the berries are sold by the poor people each market day, for five or six weeks together, in the town of Longtown, on the borders of Cumberland. This is a considerable sum for berries picked up from barren wastes, and in a district so thinly inhabited; and it is remarkable that the ready sale for them has not tempted some person to make the trial to supply the market in a more certain and regular way; if they could not be consumed or disposed of in the neighbourhood where they may be grown, they could easily be sent to a great distance without being spoiled. There is one strong argument in favour of their cultivation, which is, that they may be made to grow with little trouble in places and on soils where few other useful plants yet known will grow to advantage. It may be said that the demand for them will be limited and uncertain, but that may have been said of a number of other things of a similar nature, which now meet with a regular sale, and which the growers of course endeavour to cultivate according to the demand they have for them. The American cranberry would be the easier managed, and most productive for general use; but as many prefer the flavour of the English cran-

berry, there would also be a demand for it.

**MUSA.**—The banana is not known in an uncultivated state. The wildest tribes of South America, who depend upon this fruit for their subsistence, propagate the plant by suckers. Eight or nine months after the sucker has been planted, the banana begins to form its clusters, and the fruit may be collected in the tenth and eleventh months. When the stalk is cut, the fruit of which has ripened, a sprout is put forth, which again bears fruit in three months. The whole labour of cultivation which is required for a plantation of bananas is, to cut the stalks laden with ripe fruit, and to give the plants a slight nourishment once or twice a year, by digging round the roots. A spot of a little more than a thousand square feet will contain from thirty to forty banana plants. A cluster of bananas, produced on a single plant, often contains from one hundred and sixty to one hundred and eighty fruits, and weighs from seventy to eighty pounds. But reckoning the weight of a cluster only at forty pounds, such a plantation would produce more than four thousand pounds of nutritive substance. M. Humboldt calculates, that as thirty-three pounds of wheat and ninety-nine pounds of potatoes, require the same space as that in which four thousand pounds of bananas are grown, the produce of bananas is, consequently, to that of wheat as 133 to 1, and to that of potatoes as 44 to 1. The facility with which the banana can be cultivated, has doubtless contributed to arrest the progress of improvement in tropical regions. In the new continent, civilization first commenced on the mountains, in a soil of inferior fertility. Necessity awakens industry, and industry calls forth the intellectual powers of the human race. When these are developed, man does not sit in a cabin, gathering the fruits of his little patch of bananas, asking no greater luxuries, and proposing no higher ends of life than to eat and to sleep. He subdues to his use all the treasures of the earth by his labour and his skill; and he carries his industry forward to its utmost limits, by the consideration that he has active duties to perform. The idleness of the poor Indian keeps him where he has been for ages, little elevated above the inferior animal. The industry of the European under his colder skies, and with a less fertile soil, has surrounded him with all the blessings of society—its comforts, its affections, its virtues, and its intellectual riches.

**ROTATION OF CROPS.**—It has been long known to agriculturists that considerable advantage is obtained by a rotation of crops; but it was supposed that the roots of wheat would abstract that portion of nutriment mat-

ter which came in contact with the tendrils, and that the roots of another plant, taking a different direction, would in such situations also find support. Thus, plants have been considered as exhausting the soil only in those parts which surround the extremities of the roots. The celebrated Decandolle, however, had long suspected noxious excretions at the roots of plants, and this supposition has been verified by Macaire and Marcet of Geneva. One plant gave out a little narcotic principle, which was found injurious to similar plants, though in others it produced a luxuriant vegetation. Thus, an old apple orchard will not answer for the culture of similar trees, while many other fruit-trees will flourish in that soil. It is also observed in some pastures in contact with the blue lias marl, that cattle feeding after the first cutting are frequently much injured, while the same grass made into hay produces no bad results from its consumption. The ascertainment of the nature of these excretions, in those grasses and vegetables which are more particularly the object of the agriculturist, might lead to a more judicious selection as to the rotation of crops.

**FECUNDITY OF PLANTS.**—Several examples of this are to be found in the volume on *Vegetable Substances used for the Food of Man*. Sir Kenelm Digby asserted in 1660, that "there was in the possession of the fathers of Christian doctrine, at Paris, a plant of barley which they at that time kept as a curiosity, and which consisted of 249 stalks, springing from one stalk or grain, and in which they counted above 18,000 grains or seeds of barley." There is another well-authenticated fact relative to the power of increase residing in wheat. The result, however was in this instance obtained by careful cultivation. As the plant tillered or sent up stalks, it was divided and subdivided, till at length the original root was multiplied into 500 plants, each of which produced more than forty ears, "The wheat, when separated from the straw, weighed forty-seven pounds and seven ounces, and measured three pecks and three quarters, the estimated number of grains being 576,840. The seeds of many kinds of vegetables are so numerous that, if the whole produce of a single plant were put into the earth, and again this second produce were made to yield a harvest, and so on, in a very few years the entire surface of the earth would be too limited for the sowing of the seed thus abundantly supplied. The hyoscyamus, or henbane, which of all known plants, produces the greatest number of seeds, would for this purpose require no more than four years. According to some experiments the hyoscyamus produces more than 50,000 seeds.

WHAT CONSTITUTES AN AMATEUR?—This question put to us in twenty forms may be thus answered.—If a man—no matter whether he be a gardener or otherwise—propagates for sale and takes orders, he is held to be a dealer. If a man raise a good seedling and divides the stock between two or more, when he sells it, he is held to be a dealer, but if the stock be sold to one person only, he is not held on that account to be a dealer; when a seedling is propagated for sale, and sold out to different persons in dry roots, professedly, and at a price each, it constitutes dealing; but if one nurseryman have the whole stock it does not; at least, such was the decision of the Metropolitan Society. The obvious intention of drawing a distinction is, to protect the nurseryman's business, and therefore, to call all those who make a profit—which ought to go to nurserymen—what they really are, viz., DEALERS, at the same time not to damp the ardour of those who persevere in the raising of new flowers, or to cramp the energies of those who dispose of their stock to nurserymen without dividing it, and thus prepare themselves for a more spirited outlay the following season.

#### THE MOSS ROSE.—FROM THE GERMAN.

THE angel of the flowers, one day,  
Beneath a rose tree sleeping lay,  
That Spirit—to whose charge is given  
To bathe the young buds in dews from heaven,  
Awaking from his light repose,  
The angel whispered to the rose:  
"O fondest object of my care,  
Still fairest found where all are fair,  
For the sweet shade thou'st giv'n to me,  
Ask what thou wilt, 'tis granted thee"  
Then, said the rose, with deepen'd glow,  
"On me another grace bestow."  
The Spirit paused, in silent thought,  
What grace was there that flower had not?  
'Twas but a moment—o'er the rose,  
A veil of moss the angel throws,  
And robed in nature's simplest weed,  
Could there a flower that rose exceed?

ON SOWING THE SEEDS OF THE CALCEOLARIA.—BY JAMES HERIOT.—In reading over your directions for sowing these seeds, the method you propose is, in my opinion, correct, in so far as preparing the pot or pan for the seeds, and the levelling the mould, but instead of then sowing the seeds, I find it answers better to damp the mould, and then to sow the seeds, and leave them without sprinkling any earth over them whatever: if the pot is placed in a shaded part in the greenhouse or frame, the seeds will come away much thicker than if they are covered; this I find from experience, and was adopted in consequence of the advice of a gardener of great practical knowledge, in this neighbourhood, who remarked that "the seeds of the Calceolaria are very easily overlaid." Your plan will, I have

no doubt, succeed, if carefully performed, but mine will succeed with the most inexperienced amateur, and I therefore strongly recommend its adoption.

ON THE DISEASE IN PANSIES.—BY JAMES HERIOT.—The Pansy, or Heartsease, (viola tricolour) has within the period of a few years, when its cultivation was first attended to by Mr. Thomson, then gardener to the late Lord Gambier, at Iver, and Mr. Archibald Gorrie, gardener to the late General Stewart, at Rait, in Perthshire, each of whom increased the size and good qualities of the common garden flower by careful cross impregnation, become a florists' flower, and is cultivated in every garden.

It is well known, that a disease has made its appearance on the Pansy, which if not attended to, speedily destroys the plant attacked, and spreads to other plants in the neighbourhood. What gardeners call the disease is the *mildew* (the Erysiphe of *De Candolle*),\* but which is the effect of previous disease in the plant, as the *Erysiphe* finds a favourable situation for its growth on the diseased leaves of the Pansy, and indeed will not grow on the healthy leaf.

What is the original cause of the ill health of the Pansy, has given rise to much difference of opinion, and to various hypotheses, which I do not intend to enter upon. Dr. Lindley thinks it is owing to the soil getting too hard; you in a former number state your opinion that it is caused by insufficient drainage; I have seen it, I think, produced by frost, early in the spring or summer: but I have reasons to believe, that in many cases it is caused by over manuring, with the view of producing larger flowers. A nurseryman and florist, in the west of Scotland, (Finlayson of Paisley,) who is celebrated for his various sorts of florists flowers, and his excellent management of them, informed me, that he had placed the dung for his Pansies, about eleven or twelve inches below the surface; that the Pansies were quite healthy until the roots reached the dung, when plant after plant appeared affected with the disease: at last, he told his brother, his partner in trade, that unless they took up the plants they would lose them all, and this they were forced to do and succeeded in arresting the evil. If this is as I presume one of the causes of disease in the Pansy, it is evident that the cultivators of it have themselves to blame. If they are determined to grow immense flowers by heavy dunging, they may expect that they will bring on the disease, and in that case they ought to keep their breeding stock separate from what they intend for exhibition.

I formerly noticed that dusting the diseased plants with sulphur, will in most cases arrest the disease, if not entirely cure the plant.

\* See "The Gardener," vol. ii., p. 285. ]



## ARBORICULTURAL ILLUSTRATIONS.

## No. 2.—THE LIME.

Of all the trees whose usefulness is scarcely known, but which has a multiplicity of claims, the Lime, or Linden tree, botanically called *Tilia*, is the most conspicuous. In flower it is so valuable to the keepers of bees, that honey from the neighbourhood of the Lime forests, brings double the price of the ordinary sort. The inner bark of the tree is the universally used bast which forms the Russia mats, and when pulled to pieces again is used so extensively in the gardens of the united kingdom: and as to the wood itself it is by far the best on many accounts for carvings, and is the material of which some of the finest in the world are formed. Then its lightness, softness (and strength with it), admirably adapt it for musical instrument makers, for architects to form models with, and for the general use of turners.

There are several varieties, but they are more botanical than commercial. We have five sorts from North America, seven claimed as British, one from Hungary, and one from Tauria. The tree grows an immense size, and rather rapidly. It is best raised from seeds, but may be raised from layers, which are generally taken from trees that have been cut down, and which throw up many shoots, the weakest of which should be cut away to strengthen the others; these are laid in the ordinary way; but seedling trees are always the best. The seeds are to be sown as soon as they are ripe in the autumn, and be kept clear of weeds until they are large enough to plant out in nursery beds. If they are not sown till the spring they will lay in the ground till the spring following.

## Encyclopædia of Fruit.

### A TREATISE ON THE CULTURE OF THE PINE-APPLE.

*By the Author of the Domestic Gardeners' Manual, c. m. n. s.*

WE think in justice, both to the writer and to the work in which the following appeared so long ago as 1837, that the people who are now retailing all the ideas as if they were their own, should be reminded that all the world do not give them credit for originality, if some inexperienced good folk do. The treatise—for we look upon it as such—originally appeared in several separate articles; but these have been carefully looked over and joined in one paper, and though the first portion alludes to a squabble between certain persons about growing

"Pines without fire heat," which some others metamorphosed into growing "Pines without heat," and was written to clear away a mist, one would almost think that the author was reproving the pretenders of the present day, so much of it is applicable to the *vain boastings on one side*, and the *refusal of all credit on the other* which seem to have distinguished the recent wrangle. It is one of those papers of which any work may be proud, and though it appeared in the "Gardener's Gazette" which seems to supply ideas for most of the modern

writers, it is as fresh, as plain, and as useful, as anything that has been recently produced. In short, instead of its having been written and printed seven years ago, it seems as if it had been concocted out of the very articles which have appeared in various publications within the last few months. It is withal, sound, because founded on practice, and written by a practically scientific man, who may now speak for himself.

"I propose that this article be considered the first of a series, wherein I hope to remove many difficulties, to reconcile discordant opinions, and, above all, to place the culture of this estimable plant upon the secure ground of science. In the first place, however, it must be clearly understood, that I write for the amateur only, and particularly for him who desires to act for himself, and to observe, if not exclusively to perform, every operation. I, therefore, in toto, disclaim, and protest against the slightest interference with the practice of any gardener, whether he be acting on his own account and growing fruit for the market, or engaged in the service of a gentleman. 'Let well alone.' He that can, and does, produce fine fruit, must have the requisite skill, and be in possession of the means to give and receive ample satisfaction. If such an one derive any hint from the perusal of my papers, which may afford him pleasure or improvement, I shall be so far additionally gratified; but I entertain no views of the kind. I address the *tyro*, and my object is to show what he may effect, provided he have the required conditions at command.

The late conflict—excited, perhaps, merely by the omission of one word—'*On growing pines without (fire?) heat*'—has excited my notice, and requires a little explanation, which may indeed be considered as preliminary to the principal subject of this article. The *Pine Apple* can be, and has been, grown in the highest perfection, without tan or fire; that is, by the assistance of leaves, in pits, surrounded by linings of hot dung, of dung and leaves, or of leaves only; but *heat*, and *great heat too*, the plant must have; and although it be admitted that it is comparatively hardy, enduring a degree of cold, without injury to its vital power, which would destroy nine-tenths of ordinary stove plants, yet it may not be too much to assert that, to fruit the *Pine Apple* well, and to carry it through its several stages without check, in the course of from fifteen to twenty months, a temperature of not less than 70 to 75 deg. upon an average of day and night, summer and winter, is indispensably necessary.

They, then, who would succeed in this culture must have at command, and constantly, the means to secure and keep up, during the

growing season, and that of the maturation of fruit, a high and moist heat.

*Soil* of a peculiar texture and combination, as to its constituents (chemically viewed), must be provided: certain failure will attend every effort, if this source of healthy nutrition be wanting.

*Water*, though essential to life, must be administered according to the wants of the plant; for if injudiciously or needlessly applied, the roots will be paralysed, and an *untimely* check given to their absorbent powers.

The *Pine Apple* plant obeys the laws and habits prescribed and induced by its education. If it, or its progenitors, have been habitually reared by the aid of bottom heat, that system must be persisted in, or at least be abandoned with the most extreme and protracted caution.

If moisture to excess have been indulged in, a transition to a dry atmosphere will cause a most dangerous revulsion.

If *no bottom heat* have ever been applied to parent plants, and suckers upon a stock so raised, be cultivated in beds of warm, fermenting materials; or if growing young plants be plunged in them, the results will be alike unfavourable.

Having thus premised, and placed the inexperienced cultivator on his guard, it will be his own fault if he expose himself to embarrassment. With materials and judgment, pine growing is easy; without them, the attempt will be hopeless, and must involve the projector in a sea of trouble.

At this season of the year it will be useless to commence the culture with suckers or crowns; but if there be a desire to lose no time, and it be determined to commence immediately, the best and most scientific mode of proceeding, will be to adopt, and resolutely persist in, the dry stove culture (as it is erroneously called) first announced, and so successfully practised by Mr. Knight. Possessing every requisite information on this subject, furnished by the valued correspondence of that gentleman, I shall in my next article enter upon its detail. Of one thing the reader may be assured:—If the practice be correctly pursued, the fruit produced will be of the finest description; but there must be no carelessness, no remissness—all must be method, order, and punctuality.

Before I enter upon the subject of cultivating the *Pine* by the method suggested, and practised by Thos. Andrew Knight, Esq., of Downton Castle, President of the Horticultural Society of London, I shall allude to its natural history; because in this day of rapidly advancing science, I think that every one ought to be acquainted with the plants he cultivates. By a knowledge of their botani-

cal characters, and physiological structure, the pleasures of gardening are greatly enhanced; the mind enters into the pursuit, which ceases to be one whose sole object is the gratification of the senses.

*Ananassa Sativa* appears to be a native of South America, and to have been introduced to Britain about the close of the seventeenth century. The plant, till recently, was considered a species of *Bromelia*; but modern botanists have adopted Thunberg's arrangement, and though they still refer the *Ananus* to the natural order, *Bromeliaceæ*, they have made it a distinct genus; it no longer, therefore, is a species of *Bromelia*: the succulent head is the distinctive criterion. The fructification is produced in a dense spike, consisting of many flowers; each has a small triangular calyx—a corolla of three blueish or light purple petals—six stamens, a small germen, and a thread-like style. This germen enlarges into a three-celled capsule or seed vessel. By this description, it will be seen that the plant belongs to the sixth class—first order of the artificial system of Linnæus; but few would recognise the Pine-apple by the botanical features thus presented.

The following particulars, from the *Penny Cyclopædia*, will, I think, be read with interest:—

“Of *Ananassa Sativa*, the common Pine-apple, a great number of varieties are known (above fifty in the Horticultural Society's catalogue, by Munro), of which, the Moscow and common Queen, the black Jamaica, and the Antigua Queen, are the best for summer use; the Enville and the Trinidad the largest; the black Jamaica the best for winter use.”

The fruit is a mass of flowers, the calyxes and bractææ of which are fleshy, and grow firmly together into a single head; it is the points of these parts that together form what gardeners call the pips, that is to say, the rhomboidal spaces into which the surface is divided. When wild, Pine-apples bear seeds like other plants; but in a state of cultivation, generally owing to the succulence of all the parts, no seeds are produced, and consequently the plants can only be cultivated by suckers, or by their branches, which gardeners call the gills and crown.

The latter, which surmounts the fruit, is, in reality, the end of the branch round which the flowers are arranged, and if it has any tendency to ramification, as sometimes happens, it becomes what is called double. In the island of Penang, in the Indian Archipelago, there is a sort, all the flowers of which always change into branches, each of which bears a pine, terminated by a crown; so that a great cluster of Pine-apples is produced by

a single stem; specimens of this sort are called double Pines. They have never been produced in England.—(Query, the ‘monstrous Pine’ of Alton-Towers, now the subject of curiosity?)—The Pine-apple was undoubtedly unknown before the discovery of America; its incomparable flavour soon, however, caused it to be introduced into Africa and Asia, &c.’—See *Ananassa*, vol. i.

The plant is one of the numerous monocotyledonous tribe; its seed has only a single cotyledon, or seed-lobe, and the leaves exhibit the characteristic mark of the tribe, in having parallel veins. Most of the variety are very spiny; and the arrangement of the spines forms a prominent feature in the distinction of the varieties. The reader is referred to Mr. Munro's arrangement, copied from the Transactions into several of the horticultural periodicals. Mr. Knight commenced his experiments in June, 1819, upon nine small plants, of the variety named the Ripley Queen; his object was to prove that the practice of plunging the pots into beds of very warm tan, was founded in error, and productive of serious injury to the roots. He succeeded at once, and the actual quotations which will in due course be given, will prove to the unprejudiced mind that, with slight modifications, he has most successfully pursued the same course with undeviating success. Obloquy, ill-timed and misplaced sarcasm, and fallacious statements of failure, have been liberally bestowed upon his simple and veracious statement of facts; but, *magnus est veritas*:—the truth has prevailed! and, as ‘a tree is known by its fruits,’ so the unrivalled excellence of his Pines has, to those who have tasted them, afforded irrefragable evidence of the science and skill of the venerable innovator of defective and now exploded practice.

To succeed in this method of culture, the strictest attention must be given to the machinery. The objects to be kept in view are:—a house (whether curvilinear, or sashed in the usual manner), which can be made perfectly dry during the early dark months: this condition implies a soil and situation naturally dry, and not subject to moist exhalations; that it be furnished with a brick flue, composed of the best materials, put together in the most workmanlike manner, so as to command the entire atmosphere of the stove, and yield equable heat. This flue may run round the four sides, near the walls, and deliver itself into a chimney nearly over the entrance of the fire; or, it may consist of two courses built one over the other, and situated at about one third of the breadth of the house within the front wall, and two-thirds in advance of the back wall: the return course of such



flues, if they be well built, acquires a very equal and commanding temperature. *The slope of the lights*, and the glazing should be such as to prevent drip; and the laps ought to be extremely close and true, or else secured with good black putty, and not exceeding  $\frac{1}{4}$ th of an inch in width.

The walls of the erection must be strong, and of the best workmanship; I would in all cases recommend the cellular structure, nine inches wide, constructed of the soundest, most regular bricks, and the best stone-lime mortar.

These three conditions are essential to success in pursuing a mode of culture which requires a very dry atmosphere during the months of November, December, and the half of January, with comparatively low temperature; and a gradually increasing degree of moisture, till it amount to the vapour of a steam-bath, with corresponding high temperature, during the growing months. The *sun* is the primary agent, and the science of the method is founded upon the close correspondence which is maintained between the increments and decrease of his beams, and the power of the sub-agents, air, water, and fire.

They who commence Pine-growing must labour under some disadvantages, for the reasons assigned in the first article. I would, however, say that, if a stock can be procured from some friend, or dealer, who has never plunged his pots in any fermenting beds, he will begin his work with fewer chances of failure than if he were to start with plants which had been accustomed to what is called bottom heat. I suppose that no one can hope to obtain four or five dozen of plants which have been subject to Mr. Knight's treatment: but I may presume that it will be possible to procure that number of *old stocks*, from which the fruit has been cut, furnished with one or two suckers. With this proviso, we have a point to start from, and the house, or flued pit being ready, the plants shall be introduced to their new educational *habitat*, by the following extract from a letter, which tallies exactly with a more recent statement made by Mr. Knight's gardener:—"I always plant my *old* plants in very deep pots, thereby preserving to a single sucker (which alone remains attached), the roots and stem, with the sap both contain, of the old plant." The gardener, Mr. Lauder, was rather more particular in a letter which appeared in print, per date March 31, 1835; he informs us, that, "When fruit is shown, one sucker only is preserved, the rest taken off as they appear. When the fruit is cut, the plant is taken up, and all but four or five leaves are scaled off, some of those of the sucker also; the few remaining old leaves are, as they become mature, taken off, and the old stool entirely covered with earth.

The pots are cylinders, narrow and deep, varying in size, according to that of the plant and its sucker. These go at once into the fruiting pot, and are never removed; fruit is produced in about eighteen months: the suckers are rarely less than from a foot to eighteen inches high."

The soil used is thus described by Mr. Knight:—"The green and fresh turf of the alluvial soil of a river side, in mixture with unfermented horse-dung, or other manure, when that is not readily obtained. I consider green turf to be, under all circumstances, extremely favourable to the growth of plants."—"I never take off any part of the roots of the Pine-apple plant, unless I wish to retard its time of fruiting; and if the pots or mould contain any dead roots, I let them remain; experience having satisfied me that the dead roots of any plant afford excellent food to the living roots of plants of the same species."

One observation requires to be made; it should precede the extracts on 'Temperature,' which will soon appear. At the present season, if the plants be potted in deep pots, the green turf ought not to be in a wet, clammy state; the soil adhering should be dry, for the grass and horse droppings will afford moisture sufficient. If horse droppings cannot be had, the dung of old mushroom-beds, made from those droppings, is excellent. One sixth part of manure, and that perhaps, placed in greatest proportion near the bottom of the pot, will suffice. No drainage, excepting a thick, inverted turf, is employed; the grass and fibres, as they decay, give out heat, and gases, which vastly stimulate and nourish the herb." It ought to have been said before, that each pot is placed upon a pier made of loose bricks, by which means the foliage of the pine can be brought nearer to, or removed farther from the glass. These bricks, and the floor of the house, when once saturated with water, yield a volume of vapour during the growing season. But previously to *that*, every part of the house must be dry, and the following observations apply to the present period of the year, wherein every day witnesses a decrease of the solar light.

"I do not wish to see the house in winter, that is, in the early part, above the temperature of 60 degrees, nor ever lower than 48 degrees, but the Pine-apple, when its mould and the air of the house are dry and the plant not growing much, will bear, during the night, without injury, a temperature as low as 34 degrees." The air, the soil, and the entire house, are kept dry till the turn of days; and the temperature, by night, to about 50,

by day 60, with fire. As light increases, the flues are put into stronger action, and this shall be duly noticed. It will suffice, now, to say that the fuel chiefly used is made of coal-dust, and wet, clayey mud, three or four parts of the coal to one of the clay, beat up to a consistent mass, which can be cut into pieces, and thrown wet into the fire. Mr. Knight is very partial to this fuel; other persons must employ that species which can be most conveniently procured.

The next article will conclude the series of culture upon the *Downton plan*. After the turn of the year, I hope to resume the subject at seasonable periods.

It has been shown that Mr. Knight made use of the *green moist turf*, cut from the side of a river, incorporated with a portion of fresh horse droppings. This compost I have found to be almost, without exception, disliked by practical gardeners; 'we don't approve of green turf,' a very philosophical reason this, equally satisfactory and convincing, nearly as much so as the following:—

'I do not like thee, Doctor Fell,  
The reason why I cannot tell!  
But I don't like thee, Doctor Fell.'

A turf from a river's side, implies a loam of soft unctuous character, almost invariably free from that harsh, gravelly sand, which confers a binding quality on the loams of many districts; and the verdant herbage attached to it secures one of the requisite conditions of successful pine-growing. The soil, indicated by the native habits of *Ananassa* is a loose, open, vegetable, earth:—the plant is found to flourish in the deep shades of the woods where decayed leaves and rotten wood form its bed: I have conversed with those who have had undoubted evidence of the fact; but such a soil it is extremely difficult to imitate in our cold climates. On the continent of Europe, many gardeners, in the highest establishments, employ peat, and find that vegetable substance very appropriate.—The loam of my garden, and that of the fields around me, is superior for every purpose of the farm, and for the growth of the *Leguminosæ*, and the *Brassicæ* tribe; but I could never, by any art I could employ, so abstract or correct the harsh sand as to render it suitable to the pine. A loam, to be any value, must be constituted of an extremely fine, silicious earth, in very large proportions, united with enough of alumen (or the matter of pure clay,) to give softness and unctuousity, and just that tendency to adhesiveness which will, when moderately moist, enable the gardener to form it into a ball when pressed by the hand, but no more. Now the green turfy loam, is held together by the intermatting of its fibrous

roots; and the substance, when chopped up and pressed into the pot, though firm, is open; and from the moment it is brought into contact with the roots of the pine, begins to decay—that is,—in chemical language—to undergo decomposition, by the play of electrical affinities among its constituent.

One fact the curious reader should bear in mind; for if it be not strictly correct to the letter, is almost in all cases observable. The pure earths, be their quality what it may, reduce any vegetable, or putrescent substances united with them, into earths of the same constitution. When the quantity of vegetable matter is great, compared with that of the earth with which it is in union, its decomposition and reduction are protracted; and this is the case with green river turf. During the decomposition some heat is evolved, and the vital principle of a plant is stimulated. But green turf, taken from an ordinary meadow, is often worthless; for if the loam be naturally rigid, in consequence of the superabundance of coarse, gravelly sand, the grass and roots are speedily decomposed, and a harsh loam only is left, that becomes an impracticable ball, hard as a brick, through which the roots of a Pine can never pass. Let the cultivator examine the roots of his Pines from time to time, and he will soon obtain a criterion,—an unerring guide to his future practice. If the fibres be numerous and white, increase rapidly, and enclose the ball in a firm and continuous coil, his prospects are most encouraging; the herbage will speedily become of a dark and healthy green, it will grow with rapidity, and, unless checked by some mismanagement, progress onward to the fruiting stage. If the roots, instead of forming the ball, and courting the sides of the pot, are free and discoloured, the soil must be suspected, and an alteration must be made, or small fruit, the product of debilitated foliage, will be the inevitable result.

*Bottom heat*, when seasonably applied to a rootless sucker, is the most certain agent that can be employed; thus Mr. Knight himself observes, that suckers and crowns never strike root more freely than when excited by a common hot bed, but the heat of a dung, tan, or leaf-bed (say from 90 to 100 deg.) when applied to the pot of a rooted plant, surrounded by inappropriate soil, will produce the decay and total decomposition of every fibre.

This fact leads me to say, that for several years I had opportunities to inspect a small collection of Pine plants, which by no art or contrivance could be made to flourish. Every agent of heat or stimulus was at command; but plants of every size and age, whether home raised or bought in, failed; the small ones would not grow, the larger, however fine they

might be, lost their verdure, became yellow, or of a dingy red, and dwindled. At length a loam, produced by the slow reduction of couch grass roots during two years exposure to the weather, was tried; in one week every symptom of improvement was visible, and now, the pots become filled with a coil of roots so rapidly, that a re-potting has recently been required, though the season of the year could scarcely warrant it. *Couch-roots* are slow of decomposition; and if they be raked or harrowed off a mellow loam, with as small a portion of the native earth as possible adhering to them, produce in two or three years one of the most excellent of earthly media, either for the Pine-apple plant, or the subjects of the melon tribe. It ought, at the time of potting, to be blended with about a sixth part of manure from old mushroom beds—or even of recent horse droppings. I caution the gardener, however, against the use of sheep-dung, though I know that it was employed in a very celebrated garden. I have seen it produce innumerable mushrooms (*Agaricus Campestris*); and, singular as the circumstance may appear, my Pine plants were, in several instances, in the winter of 1835, heaved out of their pots by the stem of a large mushroom, acting as a lever, of which, the base or root, was the fulcrum, and the head the prop, or overcoming power.

This manure also generated a race of flies, the chrysalides of which were found in most of the pots; every plant exposed to the spawn of the mushroom, or to the insects, was, to all appearance, poisoned; it never thrived well afterwards.

If soft, green, alluvial turf cannot be obtained, the most perfect substitute may be found in decomposed couch roots, raked off the surface of a corn field, the staple earth of which is a free, unctuous loam. G. I. T.

#### SUBSTITUTES FOR GLASS AS COVERINGS FOR HOUSES, FRAMES, AND PITS; AND SUBSTITUTES FOR MATS.

YEARS ago, but within the memory of not very old gardeners, oiled paper was in very general use as coverings for various things, as substitutes for glass. The advantages were lightness and cheapness—the disadvantages were its liability to damage, and want of light. Presuming the advantages could be retained, and the disadvantages got rid of, there can be no question but much would be done which is at present left undone. We have seen a transparent, light texture, perfectly impervious to wet, admitting much more light than oiled paper, though not so much as glass, quite as light in the hand, and in every way adapted

for the winter preservation of most pit and frame plants; adapted for many wants and uses now supplied by glass only, and which is to be had at a much less price. It is not thicker than paper—it is of much less weight, and it only remains to be proved by experiment whether it will resist the cold so well and so long as ordinary glass lights. Small frames covered with it would be adequate to most of the purposes of ordinary hand-glasses, and we have yet to learn that it will not answer for houses and conservatories, particularly in places where stained glass may be imitated, for the price would be exceedingly moderate, and the effect as beautiful—nay, more beautiful—than glass itself. Connected with this subject, is the question, of whether a cheap waterproof material would not be infinitely better than mats to keep off the cold frosts of winter; for, so far as our experience goes, one such cloth would wear out a dozen mats of the same size, while we doubt if it would be more than double the price. The advantages of these waterproof coverings over mats are many; first, they cause no litter; next, they are warmer, then they keep off all the longest and hardest showers, which mats do not; lastly, they roll up and pack away in a small compass, and give infinitely less trouble. There are many textures, many prices, and very different appearances, but it is worth any gardener's while to try the experiment, and any of the waterproofing manufacturers, not mere sellers, can supply the means cheaply enough.

#### THE OBJECT OF HORTICULTURAL EXHIBITIONS.

THE objects to be promoted by horticultural exhibitions are, or should be—

1st. To encourage the skill of amateurs and practical gardeners.

2nd. To excite among them emulation to excel in their various branches of practice.

3rd. To promote and gratify the taste for horticulture, by placing before the public the most beautiful specimens of rarity and skill in fruit, flowers, and plants.

Now, to encourage horticultural skill, it is necessary to adopt a series of rewards for those persons who prove themselves, by their works, to be the best; and this can only be done by imposing such restrictions upon exhibitors for prizes, as shall prevent them from being rewarded for the skill of another. To accomplish these objects, the first restriction ought to be that of having possessed a plant long enough to have made it better or worse by their own treatment; this ought to be long enough also, to prevent their profiting by a fine set for bloom, or from any other circumstance

known at the time of purchase or of obtaining possession; and this cannot be complete in very many plants under one year. There ought, therefore, to be a declaration, in which the party subscribing declares, upon his word and honour, that the plants exhibited by him were *raised from seed or cuttings*, or, if not, have been in his possession twelve months. It would thus be impossible for him to have profited by the skill of another, even in large specimens of plants, which may have come into his possession, after twenty years growing by others—for it is certain that greater skill is required to keep large specimens after we have got them, than to keep small ones; and as he must have had to grow it after blooming, and to set it for bloom again, it is in that particular stage that the greater part of the skill in the management of plants consists. By these means the gardeners, whether amateur or professional, will compete upon fair and even grounds, and the rewards ought to be sufficiently large to encourage this especial class of exhibitors to greater exertion. In the department of cut flowers, the declaration should restrict the exhibitor to having also possessed the plant from which they are cut sufficiently long to take away all chance of profiting by the skill of any other person. Thus carnations and piccotees, dahlias, roses, pinks, three months tulips, ranunculuses, and anemones, from the time of planting out; and the committees ought to give public notice that in this particular department of exhibiting plants or flowers for skill alone, they shall hold themselves empowered to call for evidence of where, how, and when any plant, root, or flower was procured, and demand of the exhibitor satisfactory proof in any case of doubt; for unless the most positive security is offered to each other, *that the exhibitors are all showing fairly*, the men of bad principle, who would evade or abuse the regulations, would be showing under the most unfair advantages over the scrupulous observer of all points, and the most honest exhibitors would rarely be rewarded. We come now to that object upon which a good deal depends—the promotion and gratification of horticultural taste.

The first point to be secured here is the exhibition of good and rare plants. It is the quality of the subjects exhibited that rivets public attention, without which exhibitions would do but little. The small societies scattered all over the kingdom for years, have done much towards increasing the taste and exciting the emulation of the members and exhibitors; but persons must have already possessed a taste of some kind for flowers, or they would not have joined such societies. But since the public has been admitted to shows, *hundreds*

*who never had the slightest notion of floriculture and horticulture, have been imperceptibly led to delight in them.* Instead of seeing merely the same flowers that might be found at any first-rate nursery, the productions are the best specimens of the best private gardens of persons induced to exhibit: to supply this call not a single restriction that could keep out a plant ought to be adopted. The most rare and the most beautiful are wanted—no restriction that would keep out the one or the other should be tolerated. For the purpose of encouraging all that is good, and rare, and beautiful, a class should be invariably encouraged in which the only declaration should be, that the productions were *bona fide* the property of the exhibitor: by this the individuals, who possessed fine plants would be encouraged to show them. There would be a direct inducement to excel in collecting, and also to exhibit what was possessed; nor is it any objection to this (though we have heard it made) that the most wealthy would be the winners; even if the most wealthy were so—because the man of moderate income exhibits with competitors of his class for the prizes awarded to skill—the wealthy exhibits against the wealthy for prizes awarded to the most spirited buyer. It is a mere matter of detail to consider what proportion the prizes for skill and the prizes for the best productions, without restriction, shall bear to each other; but that the principle is good we are quite sure, and that it will answer we are convinced. The plan of not requiring a declaration at the shows of collections has been tried with great advantage—the object was to get plants at the shows, and it had the effect. But if skill is to be rewarded that skill must be apparent—there may be some skill in flowering a plant well after it is set for bloom, but the real skill is in growing it after it has bloomed, to set it well for the next year, and no man ought to have a prize for a finely flowered specimen unless he had the growing of it for bloom, as well as the blooming of it for show.

By widening the distinction between the class of collectors, and the class of actual growers, there will be no temptation to declare falsely, and the practical men will be left to themselves. Various details may be entered into to suit the place where a show is held, and the time of year; for instance, it may be stipulated that certain plants should only be one year old, that others shall be exhibited in the way and of the age best calculated to show the talents of the exhibitor; but, at all events we affirm: 1st, that no man shows a fair trial of his skill in plants which bloom once a year, until he has had it through the whole season, or raised it from seed, layers, or cuttings him-

self—and we trust the Horticultural Society will have an eye to this before their next circular comes out. The frivolous stuff about possessing *everything* three months is perfectly inadequate to show skill, and a mischievous banishment of many good specimens, which have been bought, imported, or even raised, within that time.

We have already given many useful hints about the management of Horticultural Shows, but the questions upon various points crowd in upon us so, that new points hardly contemplated are brought under our notice, and the foregoing will give more information than twenty direct answers. It is unquestionably our wish to treat all exhibitors alike, when the two classes we have pointed out are as distinct as any they can well be and as easily provided for. It would be indeed a great improvement upon the present distinctions between dealers and amateurs, a distinction made that dealers might not run down their own customers, but in collections of plants amateurs have long carried away the laurels.



PINGUICULA VULGARIS.

MANY insignificant plants look very well on paper, and it would be a curious speculation to enquire how many flowers have been purchased from the representations that have appeared in books, and thoroughly disappointed the buyers. Of this class, we suspect, is the subject of our notice. As a botanical subject it has its peculiarities, and therefore it is no-

ticed in modern works, the chief characteristics of which are that of dragging, insignificant plants, from their obscurity, and clothing them with all the charms which the artist can produce. The subject of the present paper is one of the weeds called Butter-wort, and as a neat little affair, is just worth a place, simply because it has been raised to a sort of demi-importance by the fact of having it figured in one of the modern botanical periodicals.

Miller dismisses it as it deserves to be dismissed with the simple remark "this plant is found growing upon bogs in many parts of England, but is never cultivated in gardens, so I shall pass it over with barely mentioning it." Mr. Paxton, speaking of the genus, says, "Beautiful little plant, but difficult to keep artificially. *P. Grandiflora* will succeed in common bog soil. The other species require a shaded morass to come to any perfection. *Pinguicula Alpina* is from Germany, and bears a white flower. *P. Edentula* from North America, has a yellow flower. *P. Lutea*, also from Carolina, has a yellow flower. *P. Grandiflora*, *P. Lucilanica* and *Vulgaris* are British, the first having a blue, the second a lilac, and the third a violet coloured flower. They are too small even to be favourites, except among extensive botanical collectors.

#### THE EARLY DAYS OF THE HORTICULTURAL SOCIETY OF LONDON.

Few people are acquainted with the origin of this establishment, and still fewer with its extraordinary constitution. We believe it to be the only society (always under a charter) in which the fellows who pay all the money that supports it have no voice at the meetings, nor controul over the transactions, but are merely privileged to attend the meetings, see what is to be done, hear what is to be heard, and not even to vote in the supposed resolutions of thanks which are recorded for things sent. As, however, popular reforms become general this will doubtless be one of the subjects pointed out for large alterations. There is, it is true, an annual meeting, at which certain officers are elected, but even here, there are printed lists, with the names to be elected, and the fellows who wish to alter any have to cross out the printed names, and write others, which, however, cannot be done without proclaiming the object in view, and marking the persons who do so. Of course, therefore, this annual meeting is not attended by many, and we have known all the officers to be elected by not more than twenty or thirty persons out of

many hundreds. Mr. Booth's account of its days is very succinct.

The idea of establishing a society for the improvement of horticulture, originated with John Wedgwood, Esq., of Betley, in Staffordshire, and at his instance a meeting was held at the house of Mr. Hatchard, in Piccadilly, on the 7th of March, 1804, to take into consideration the most effectual means of accomplishing the object desired. At this meeting, which was attended by the Right Hon. Charles Greville, Right Hon. Sir Jos. Banks, Bart., R. A. Salisbury, Esq., W. T. Ayton, Mr. William Forsyth, and Mr. James Dickson, the chair was taken by Mr. Wedgwood, when such resolutions were passed as were deemed necessary for the immediate regulations of the infant society. It was also agreed that each of these original members should have the privilege of recommending three persons to become members, and on the fourteenth of the same month a meeting was held at Mr. Hatchard's, when the name of John Hawkins, Esq., was added to the number of original members, with a similar privilege of nomination. From the year 1804 to the spring of 1809 the society continued to increase, the members, after their first nomination, being chosen by ballot, and as it was daily acquiring a character which promised fair to place it beyond the vicissitudes arising from fashion or caprice, those gentlemen who took an active share in its direction, felt the propriety of obtaining its incorporation by royal charter. This was accomplished, and the charter, bearing date of 17th of April, 1809, was addressed to George, Earl of Dartmouth; Edward, Earl Powis; Brownlow, Lord Bishop of Winchester; John Lord Selsey; Charles Greville, Sir Joseph Banks, William Townsend Aiton, John Elliot, Thomas Andrew Knight, Charles Miller, R. A. Salisbury, John Trevelyan, James Dickson, Thomas Hoy, and William Smith, of whom the three last were gardeners.

An early object of the society, which was not announced, however, till February 5, 1811, was to present honorary premiums or medals to such persons as should raise and produce before them, any new and valuable variety of fruit or esculent plant, or who should make any important discovery in horticulture; but as they considered every one of these to be still capable of acquiring a greater degree of perfection, they did not think it necessary to direct the attention of the gardeners to the improvement of any particular plant, but the following were proposed as objects deserving, amongst others, the attention of experimental horticulturists. For new varieties of the potato, better calculated for forcing, and for supplying the markets earlier in the summer than

those at present cultivated; a rich and sweet variety of the common red currant, which might probably be obtained from seed, by appropriate selection through a few successive generations; new varieties of the gooseberry which might supply the market with green fruit at earlier periods, and mature fruit at earlier and later periods than those now cultivated; new varieties of pears, sufficiently hardy to grow and ripen on standard trees; a good and early variety of grape, better adapted to the climate of Great Britain in open air than any now known; better and more productive varieties of the apple, and capable of being longer preserved in perfection; a good early nectarine; a variety of the strawberry, earlier than the common scarlet; and of the cherry which would ripen before the early May; more early and hardy varieties of the peach; plums of various kinds. They conclude their recommendations with stating that in pointing out the preceding objects as deserving the attention of gardeners, it was not the intention of the society to limit its patronage to those only, but on the contrary, it was their wish to promote and encourage successful experiments in every branch of useful and ornamental horticulture.

In the course of its proceedings, which were restricted at first to the reading of papers on different practical subjects in horticulture, and in the promotion of friendly intercourse amongst cultivators, the first volume of its Transactions was published in 1812, containing fifty-five communications from Sir Joseph Banks, Mr. Knight, Mr. Maker, Mr. Salisbury, the secretary, and other practical men. The second volume was published after an interval of six years, or in 1818; in the preface to which, the council "congratulate the members on the progressive advancement of their institution." "The society," they state, "can hardly be said to have emerged from its infancy, yet it already displays a degree of vigour which is not only calculated to render its present labours beneficial, but holds out most flattering hopes of what it may accomplish hereafter. When the objects are considered which the society has in view, the encouragement given to it will not be deemed to be ill bestowed. Comprehending horticulture in the widest extent, yet so as not to interfere with any matters which more properly belong to botany or to agriculture (in the strict and limited sense) its pursuits must be decidedly useful. It takes under its care all the variety of produce, which the garden can yield as food and sustenance to man. Of these productions some are become articles of necessity, while others remain objects of enjoyment. Inasmuch as the society endeavours to

improve and multiply the former, it assists in relieving the wants of the community, and contributes to its comforts, and in cultivating the latter, it may likewise claim some merit. An association of this kind, which is not merely speculative, but aims at practical advantages, is not an inefficient member of the state, nor will it be regarded with indifference by an enlightened government, to whom every thing that has a reference to the well being of the people must appear interesting." The second volume contains no less than 101 communications, of which thirty-two are from T. A. Knight, Esq., nine from Joseph Sabine, Esq., seven from Dr. Noehden, and also from Sir Joseph Banks, Sir C. Hawkins, Sir A. Carlisle, Sir Brooke Boothby, and other distinguished members. Up to May, 1816, we find that twenty-two medals had been presented for various exhibitions and contributions, and including the gold medal to Sir Joseph Banks, for his unremitted and important services to the Society from its first institution, as well as silver medals, gilt, to P. A. Hanrott, Esq., and T. Metcalf, Esq., for their gratuitous services, as solicitors to the Society in obtaining its charter. From the 1st of May, 1816, to the 1st of May, 1817, there were presented eleven, including to Joseph Sabine, Esq., the secretary, the gold medal, as a token of the high sense entertained by the Society of the very great assiduity and intelligence manifested by him, as well in the formation of the bye laws, as in arranging and settling the long and very intricate accounts of the Society.

The third volume of the Transactions was published after an interval of but two years. In this the council direct the notice of the members to that which has more immediately engaged their attention, the formation of an Experimental Garden. "What they have yet been able to accomplish in this respect, they consider only as temporary; but it has been sufficient to prove that they have not overrated the advantages to be derived to horticulture from a garden of such description, upon an extensive scale, and look forward with confidence to that period, when, either by their own increased efforts, or by an aid superior to their own, they may effect an establishment, which shall at once become a national school for the propagation of horticultural knowledge, and a standard of reference for the authenticity of every species of garden produce." They also announce, that the unexampled rapidity with which the Society has increased in number, rendered it absolutely necessary to provide such apartments as might be sufficiently commodious for transacting their business, for which purpose they had taken the rooms they at present occupy, and also allude to the for-

mation of an Horticultural Library of Reference, for the use of members generally, as a point of considerable importance. The third volume contains eighty-eight papers; and the medals distributed from May 1, 1817, to May 1, 1818, were fifteen; and from that period to May 1, 1819, they were twenty.

Since this period the popularity of horticulture, through the establishment of the Metropolitan Society of Florists, and other societies, in almost every county and town of any pretensions, has caused vast changes. The gardens have been made and augmented; the library is extensive, the resources great. However, the complaint is, that all these advantages are too exclusively for the benefit of a very few people, through the totally powerless character of the general meetings, and the want of a more popular control over the vast property of the Society.

#### RUDIMENTS OF EDUCATION.

THERE can be no question but that a child, while undergoing his education, should be taught common sense among the various subjects that are driven into his head, and that there would be much more useful men and boys, if some of the very common things which people are supposed to learn spontaneously, or, rather, take naturally, were regularly taught. The Americans are beginning to be awake to this, for there is no denying, the schools here are behind hand, and that some of the most learned men that have ever graced our colleges, have, with all their scholastic acquirements, been found unusually deficient of common sense, that knowledge which is useful in all places and in all ranks of life, and which must be acquired before a man can really shine. It is the want of this common sense which has led to men of high attainments falling low in the estimation of the croud, and in too many instances, the most accomplished scholar cannot apply his knowledge to any of the ordinary purposes of business or conversation. He is like a magazine of valuables, without the key. The doctrine now advocated in America is, that children should be taught those things which may appear very silly to those who know them; but there is a good deal more in it than pedants can see. We remember once to have met a gentleman connected with the East India Company well acquainted with all the eastern languages, but utterly ignorant of the most common place matters, and the questions he would ask about ordinary things would be almost laughed at in a boy of six years of age. The fact is, that his mind had been absorbed at an early age with the attainment of those

languages, and all else was a blank. The only thing we shall mention in illustration of his acquaintance with the world is connected with his garden, though we could mention a hundred as simple, if not quite so funny. He bought an engine because we had one; and, to say nothing of the fifty foolish questions we had to answer, we one morning saw a workman with his engine all to pieces, and the owner standing over him. On enquiry of the man the day after, what he had been at with a new engine, he informed us, he had taken it to pieces to explain how it acted, and he was ordered to go and do so again that morning, "but," said the mechanic, "he is the stupidest man I ever spoke to, and I cannot, for the life of me, make him understand how it sucks the water up, and then sends it out of the pipe with force." The engine was pulled to pieces and put together many times, but our worthy neighbour was as ignorant of the real principles at the end of a month as he was at the beginning. Few persons there are who have not condemned great scholars for great fools, only because the common sense portion of their education has been neglected. An American contemporary says children ought to be taught the most simple things early, and he argues thus in reference to its application to the ordinary products of a garden.

Now a child knows good and poor fruit by its taste; but there are other points about it to which it is important to direct attention. Suppose, then, any person residing in the school-district who may have paid some little attention to this subject, should take a few dozen apples, pears, or any other fruits of the season, of various kinds, good, bad, and indifferent, and make his way with them to the school house, call up the children around him, and point out their relative value, and the true reason why one should be cultivated in preference to the other. He would explain, that a good apple should be of a suitable size; regular, even shape; with a small stem; smooth, thin skin; rich, juicy, solid pulp; pleasant flavour, either tart or sweet; a small core, and few seeds. In short, that it should possess as much pleasant nutritious substance as possible, combined with the least amount of stem, skin, core, and seed. Now this, if a good bearer, would be a superior apple—worthy of a name, and of propagation. Then, by way of contrast, the children should be shown a poor apple, and their attention be called to that—not only by allowing them to judge of the difference in taste, but also by pointing out the long, large stem; the thick, coarse skin; the dry, tough, sour pulp; the large core, and the small amount of really nutriti-

ous substance in the fruit. After this, they might be taught to graft, and be instructed upon fruit-trees in general, and the best system of their management. Boys from twelve to fifteen years old may learn all this as easily as grown men, and when they come to be grown up, and manage their own farms and gardens, the great majority of them would not only have plenty of fruit around them, but that also of a first-rate quality, although they might expect no foreign market for it. In the same simple manner, the children of every rural district could be taught to judge of the relative difference in the value of vegetables; that a dry, mealy potato, is not only more agreeable to their own taste, but twice, or perhaps thrice, as nutritious for their stock feeding as a poor flavoured, watery one may be. How few, if asked, can tell the difference in the value to animals of sugar-beet and mangel-wurzel, or the succulent ruta-baga, and the coarse, pithy, white turnip. There is as great a difference in the nutriment of various kinds of winter squash and pumpkins; and yet scarce any one thinks or speaks of it. The same in the grasses; in wheat, rye, barley, oats, and corn; in cotton, and, we are not sure, in rice and sugar; the different breeds of horses, cattle, sheep, swine, and poultry; the plough, and, indeed, all agricultural implements. These may be called very homely subjects to be taught a child; but are they not of vast consequence in the aggregate to the man and to the country? We believe that persons may be found in nearly all our school districts, who would be quite capable of lecturing intelligently on the subjects herein mentioned, and willing to do it gratuitously; and if one hour a day for three months in the year could be given to these, the farmers of our country would greatly increase their stores of knowledge in a few years, understand the reasons of their practice better than they now do, and be working to much more profit and advantage.

These things are well worth considering, and especially in those schools of which the children must become labourers at their first start into life; they would all be better labouring farmers for it in agricultural districts, and they would be half prepared as apprentices to gardening. This brings us to the consideration of the subject often brought under our notice—the project of a college for the children of gardeners, but it must be the subject of a future paper.

#### FLORISTS' FLOWERS.

FLORICULTURE, considered as a branch of horticulture, is more or less within the compass of every individual who has a single rod



of ground, and may be indulged in and followed with spirit, perseverance, and advantage, in the smallest garden usually allotted to a cottage. That section of floriculture which affords the greatest pleasure with the smallest means, is the culture of florists' or show flowers. These, until the last few years, were polyanthus, auriculas, tulips, pinks, ranunculuses, and carnations; and none but persons who have watched the exhibitions and the exhibitors of these flowers, can form even a remote idea of the emulation excited among the very poorest persons; nor of the rapid advances in the quality of the flowers, which we owe entirely to the perseverance of the humble but enthusiastic cultivators, among whom "flower shows" originated, and to whose example (however much it has been improved upon) we owe all the beautiful exhibitions that take place. Spitalfields and Bethnal-green, which are now almost as confined and as smoky as the City of London, have been the very nurseries of the science. The most inconsiderable plots of ground have there contained collections of great value, and many a man who found it extremely difficult to keep his family, thought nothing of giving five or ten pounds for a tulip, though he paid it by instalments, ill spared, of a few shillings per week. No true florist cared what privation he suffered, so he but compassed his object in the attainment of a new or favourite root. Clubs were formed for the encouragement of particular flowers, the members paid a small sum monthly to form a fund for prizes, the day exhibition was a holiday for every cultivator, and they who showed the best flowers on that day obtained the prizes. Such was the enthusiasm with which the humbler growers followed the bent of their fancy, that it was not uncommon to see the cultivator of auriculas trudge ten or twenty miles with his favorite flowers packed in two boxes, and suspended like a pair of milk pails by a yoke, which he bore as proudly and as carefully as though his life and character depended on the safety of his favourite plants. These were the days when a poor weaver would take the rug from his bed, or the coat from his back, to cover his favourite flowers from the inclemency of the weather, and walk almost barefooted rather than forego his contribution to the flower society at which he was to exhibit his skill. But the principal flowers then exhibited were pinks, ranunculuses, carnations, polyanthus, and auriculas. Piccotees were hardly heard of, dahlias altogether unknown, tulips considered too sacred to cut from the bed, geraniums limited to the old scarlets, the horseshoe, peppermint scented, oak leaf, and variegated; the splendid tribe now in cultivation not even

dreamed of; and roses, except the cabbage and the moss, were known only to the aristocracy. The humble florist prided himself beyond his show flowers upon his double stocks and his larkspurs, and never soared beyond beating all his neighbours in the flowers he cultivated, and then giving them the seed to enable them to equal his own. The auricula and the pink, the ranunculus, the polyanthus, and the carnation, were the only subjects of floral exhibitions; and upon these Maddox wrote a book, which, in the days of its first appearance, was considered a prodigy in literature. Of these I propose to treat separately, not so much as to their culture, which begins to be well understood, as to the mode of conducting the shows. VERAX.

#### ADVANCE OF THE SCIENCES OF AGRICULTURE AND HORTICULTURE.

MUCH prejudice has existed against book-knowledge, and are free to confess, that so much has been written by inexperienced theorists, as to justify the farmer and gardener in receiving with extreme caution all that appears to interfere with the practice of his forefathers. But certain we are, while making the above admission, that agriculturists are far in arrears, that they remain—and appear contented to remain—a century behind their brethren of the manufacturing class, and remote from the spirit of the times, whose motto is "Onward."

It is a subject of deep regret with every mind imbued with genuine patriotic principles, to observe the great animosity which exists between the agricultural and manufacturing interests; and which vents itself in an asperity of expression, totally at variance with the true interests of both—verily, "these things ought not to be so!" They whose duty it is to "love as brethren," should be better employed; they should be convinced, and act upon the conviction, that overweening selfishness is the bane, the plague spot of the land! That, on the contrary, whatever improves the condition of the one, cannot, in reality, prove detrimental to the other; and thus it is with science. The artisan and manufacturer were long the subjects of depression and difficulty; but they wisely availed themselves of the assistance offered by science; turned every discovery to advantage; sought and found remuneration—not in high prices—but in increased production; and were enabled, at a critical moment, to hold out the helping hand to the agricultural labourer in the time of distress.

The farming and gardening interests will act wisely in laying these facts to heart; sound science—not wild theory—will promote the cause of agriculture, as surely and efficiently

as it did that of manufacture; and great improvements in the machinery of the farm and garden are at once a proof and pledge of what has been and will be effected. The power of steam, or of some agent of equal efficiency, must be brought to bear on the land; it is in progress, and its march cannot be long resisted. Chemistry, also, *if rightly understood and applied*, will be a potent auxiliary; but on this point great errors have been committed, and fallacious views entertained. It may be laid down as an incontrovertible axiom, that *analytic chemistry can never be brought to bear upon the phenomena of vegetable life*, upon bodies endowed with the *vital principle*. Its sphere of action is confined to substances deprived of life, inert as respects vitality, and, therefore, prepared to undergo decomposition. Hence, whenever the chemist pretends to investigate the changes which take place in the growing plant, he becomes bewildered, and confuses those whom he intends to instruct; but when he analyses earths, soils, and vegetable productions—such as gums, resins, starch, gluten, &c., he arrives at certain results, and can furnish his pupils with undoubted and most instructive facts.

A well regulated *rotation* is the life and soul of wise cultivation, for by it not only is abundance secured, but the very weeds are rendered auxiliaries. He who understands the order of rotation, and takes into due consideration the operation of the *roots of plants* in the soil, and upon each other, is prepared to keep his land in the highest condition, and to reap all the benefit of, perhaps, a threefold increased production.—G. W., 1837.

#### THE ENEMIES OF ROSES.

MARNOCK says the insects that attack Rose Trees are of several kinds, all very destructive, and all very difficult to destroy, principally because the means for their destruction are seldom resorted to till their ravages have commenced. The most numerous of these are the aphides, commonly called the green flies, or plant lice, which are well known to all rose-growers. These insects lay their small black eggs in autumn, generally near the axils of the buds, so that the young brood may be conveniently placed for feeding on the tender shoots when they appear. In mild seasons, these eggs are hatched about the latter end of February, and the insects produced are few and inconspicuous, many being generally destroyed by the cold. Those that remain, after twice casting their skins, arrive at their full growth about April, when they begin to breed, according to Richardson, "the first brood consists entirely of females, and each of these produces a nu-

merous progeny without the assistance of the other sex. These, though themselves produced from eggs, are viviparous. A third generation appears in May; and the months of June and July each supply two more. In the autumn, the eighth, ninth, and tenth generations are produced; two of them in August, and the last, which consists of both males and females, about the middle of September. From the females of this latter race the eggs are produced, which are intended to perpetuate the species for the following year. The parent insects deposit their eggs as near as possible to the branch buds, that the future young may be more easily supplied with nourishment (as before mentioned), and some continue to lay till the beginning of November. The eggs, at first, are green, but soon become perfectly black; they adhere to the branches by a viscous matter that surrounds them, and remain uninjured by the frost of winter."—(*Phil. Trans.*, vol. xli., p. 12). It will be seen by the above, that the best time for destroying the aphid is while it remains in the egg state; as, if suffered to breed, it multiplies to a frightful extent. For this purpose, wash the stems and branches of the rose bushes, during winter, with a composition of strong tobacco water and soft soap; or, if this be thought too expensive, with water heated to a temperature of two hundred degrees; in both cases, cleaning the branches, after the composition, or hot water, has been applied with a small painter's brush. Should this precautionary measure have been neglected, care should be taken to watch for the appearance of the first brood, and, as soon as the insects are perceived, to destroy them with lime, or tobacco water, or by fumigation: taking care never to use the nearly boiling water after the buds are expanded, though it will not do the slightest injury before that period. Each succeeding brood being much more numerous than those which preceded it, is more difficult to destroy, till the summer broods, if suffered to appear, completely clothe the young shoots, so as to make them seem nearly three times their natural thickness. In this state, the best remedy is to put half a pound of the best strong tobacco into a gallon of hot water, and as soon as the infusion has become cold, to dip the young shoots into it, letting them remain a few seconds in the water, and if they are in a very bad state, going over them a second time. After this, the shoots should be carefully washed with clean water, and the insect will generally be found to be destroyed.—(See *Gard. Mag.*, vol. x., p. 215). Choice plants may be freed from the aphides, by going over the whole plant with a soft brush, laying the infected shoots in the palm of one hand, and brushing off the insects with the other. Pruning is of little use, as the

aphides generally attack all the young shoots of a plant at the same time.—(See *Encyc. of Gard.*, edit. 1835, p. 1076). The plants may also be syringed with water in an evening, and then dusted with powdered tobacco leaves, or refuse snuff; or they may be syringed with lime water. The prodigious fecundity of the *aphis rosæ* almost surpasses belief. Reaumur has calculated, that, in five generations one *aphis* may be the progenitor of 5,904,900,000 descendants; and in ordinary seasons, there are ten generations produced on Rose bushes in the space of nine months.

#### FRUITING OF GANSEL'S BERGAMOT PEAR.

WE hardly know a subject upon which there has been more discussion, or a desideratum which there have been more experiments tried to attain, than the fruiting of this delicious but shy-bearing pear. There is something, however, so inviting in the experiment, which seems to have answered with Mr. Stone, of Winsley, near Bradford, that we gladly avail ourselves of the permission to insert a letter written by that gentleman to the Secretary of the Sidney Garden Horticultural Society of Bath, and kindly forwarded for the benefit of our readers by Mr. Kington of Tonbridge:—

“DEAR SIR.—It might be useful to your Society to know the way to procure a crop from one of the most beautiful, but hitherto unproductive of our English fruits—the Gansel's Bergamot Pear. I believe there are few gentlemen who have gardens that have not a tree of this sort; but although there is an immense annual blossom, there is scarcely ever any fruit. I know persons who have trees that for more than twenty years have not produced during the whole period, a dozen pears. I have eight of the trees against walls, and for ten years they never produced me, in any one year, more than three dozen pears. Last year I cut off from two small trees all the blossoms but one from each fruit-bud, and these trees gave me more fruit than all my other trees ever produced me. This year I have tried the same experiment upon all the trees, leaving a branch upon each tree untouched; and I find that at the present time, where the blossoms have been thinned, the fruit is healthy and as large as small horsebeans; but where they have not been thinned, it is as it used to be, unhealthy, not one-third of the size, and I have no doubt but it will all fall off. This pear, as a standard, generally produces much blossom, and I think it very probable that by the same mode of thinning the blossoms, it might be rendered as productive as the common bergamot.

WILLIAM STONE.”

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#### THEORIES OF THE SURFACE OF THE GLOBE. (Quoted by Dr. Buckland in his *Bridgewater Treatise*.)

“THE earth,” says Burnet, “was first invested with an uniform light crust, which covered the abyss of the sea, and which being broken up for the production of the deluge, formed the mountains by its fragments.”—*Theoria Sacra*.

“The deluge,” says Woodward, “was occasioned by a momentary suspension of cohesion among the particles of mineral bodies. The whole of the globe was dissolved, and the paste thus formed became penetrated with shells.”—*Essay*.

“God raised up,” says Schenckzer, “the mountains, for the purpose of allowing the waters which had produced the deluge to run off, and selected those places in which were the greatest quantity of rocks, without which the mountains could not have supported themselves.”—*Mem de l'Academ*.

“The earth was formed from the atmosphere of one comet, and deluged by the rain of another. The heat which it retained from its origin was the cause of exciting its inhabitants to sin, for which they were all drowned, except the fishes, which, having been fortunately exempt from the heat, remained innocent.”—*Whiston, New Theory*.

“The earth is an extinguished sun, a vitrified globe, on which the vapours falling down again, after it had cooled, formed seas, which afterwards deposited the limestone formations.”—*Leibnitz Protogæa*.

“The whole globe was covered with water many thousand years. The water gradually retired. All the land animals were originally inhabitants of the sea. Man was originally a fish; and there are still fish to be met with in the ocean which are half men, on their progress to the perfect human shape, and whose descendants will in process of time become men.”—*Demaiet*.

“The earth was a fragment of the sun, struck off red-hot by the blow of a comet, together with all the other planets, which were also red-hot fragments. The age of the world, then, can be calculated from the number of years which it would take to cool so large a mass from a red-hot, down to its present temperature. But it is of course growing colder every year, and, as well as the other planets, must finally be a globe of ice.”—*Buffon Theorie*.

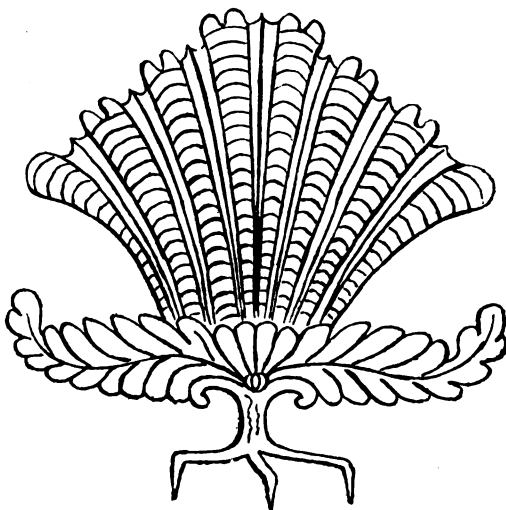
“All things were originally fluid. The waters gave birth to microscopic insects; the insects, in the course of ages, magnified themselves into the larger animals; the animals, in the course of ages, converted another portion

into clay! These two substances, in the course of ages, converted themselves into siliceous mountains are the oldest of all. All the solid parts of the earth, therefore, owe their existence to life, and without life the globe would still be entirely liquid."—*Lamarck*. This, too, is the favourite mode among the German philosophers of accounting for the formation and filling of the world.

"The earth is a great animal—it is alive; a vital fluid circulates in it; every particle of it is alive; it has instinct and volition, even to

the most elementary molecules, which attract and repel each other according to sympathies and antipathies. Every mineral has the power of converting immense masses into its own nature, as we convert food into flesh and blood. The mountains are the respiratory organs of the globe! The schists are organs of secretion, the mineral veins are abscesses, and the metals are products of disease, for which reason, most of them have a repulsive smell."—*Patrin, Dic. d'Histoire Naturelle*.

"All is done by polarization."—*Oken*.



#### CLIMBING PLANTS.

THE management of climbing plants is one of those delicate operations which require great attention and watchfulness, for if the plant be allowed to ramble two or three days, the leaves will be twisted all manner of ways when placed on the trellis. Great taste may be displayed, too, in the choice of a design, which should always be appropriate. The most delicate of all climbing plants, both as to culture, which comprises the growing of it in a healthy state, and management, which relates to the training of it upon the wire, is the *Tropicolum Tricolorum*. Its stems scarcely thicker than a thread, even when in full health and vigour, is so easily damaged, that it is the most difficult thing in the world to manage, until you accustom yourself to handle it; and with regard to the trellis, the great object is to have a design which spreads out like a fan, rather than contract like a pyramid. The above figure is well adapted to the plant, and the principal care will be—presuming the plant to be healthy—to cut back the first shoot a little,

that it may break out enough to furnish the bottom well, for by topping it afterwards, as they cover the narrower portions, each shoot will break out into lateral branches, which will be quite competent to spread out for the largest part of the trellis. Two shoots may be taken at first to furnish the spreading wings of the design at bottom, and the rest may be judiciously dispersed on the fan part of the design. The *Tropicolum* grows very rapidly, and the only care required, as it shoots, is to lay them in so judiciously as to fill the work, instead of allowing any ends to hang about: let them be carefully directed to the places most bare, and be made to fill them up.

#### A DESCRIPTIVE LIST OF AMERICAN APPLES.

BY W. R. PRINCE, FLUSHING, N. Y.

WE think very lightly of some American Apples, but the author of the following descriptions has given them as of fruit worthy to be cultivated, and rejects as unworthy Fearn

**Pippin**, Franklin's Golden Pippin, and the Old Golden Pippin, apples which we justly value in this country for their beauty as well as delicious flavour. We mention this to show that the American Apples must be very fine, the Americans have a very bad taste, or that the growers there are more artful than we should like to give them credit for. The inference to be drawn from this *honest* rejection of really good apples as unworthy of cultivation is that the one hundred and fifty-six sorts described as worthy of a place are better, a fact we should have no objection to see established, but which we doubt exceedingly. However, Mr. Prince is a highly respectable nurseryman, and entitled to as much credit as any of his countrymen, but we strongly suspect size has a good deal to do with their estimate of value, and as such the poor little Golden Pippin would be rejected untasted. However leaving our readers to form their own estimate of the authority, we merely give the descriptions from fruit:—

1. *Aunt Hannah*;—Table, winter apple.
2. *Bardin's early*;—Table.
3. *Baldwin*;—yellow and red, roundish, large size, Table and Kitchen, first rate quality in season from November to April, very productive, juicy, greatly esteemed and first rate flavour.
4. *Baldwin, sweet*;—Table and Kitchen, December to March.
5. *Beau*;—green and red, oblate, large size first quality, Table and Kitchen, Sept. to October, very productive, juicy, large and handsome.
6. *Beauty of the West*;—yellow and red, oblate, large size, Table, first quality, December to March, very productive, juicy, beautiful and fine flavour.
7. *Bell Flower, Yellow*;—yellow, oblong, large size, Table and Kitchen, first quality, October to February, very productive, juicy, fine flavour and highly esteemed.
8. *Bell Flower, Monstrous*;—yellow, oval, large size, Table and Kitchen, first quality, October to December, juicy, excellent; this and the preceding assimilate to the Porter.
9. *Bell Flower, Red*;—striped, conical, medium size, Table and Kitchen, second quality, December to January, very productive, mealy.
10. *Belmont*;—pale and yellow, roundish, large size, Table, first quality, December to March, valuable variety.
11. *Benoni*;—red, round, medium size, Table, first quality, July to August, very productive, juicy, highly flavoured, sub-acid, and greatly esteemed.
12. *Black American*;—dark and red, roundish, medium size, Table, second quality, November to February, very productive, juicy, of peculiar appearance.

13. *Black Cool*;—striped, dark and red, oblate, medium size, Table, first quality, October to April, very productive, juicy, beautiful, and superior flavour.

14. *Blinkbonny Seedling*;—pale, yellow and red, oblate, medium size, Table, first quality, August, very productive, juicy, beautiful, high spicy flavour, first rate.

15. *Bough, Large yellow*;—pale, and yellow, roundish oval, large size, Table and Kitchen, first quality, July, very productive, juicy, an excellent sweet variety.

16. *Bough, Autumn, or Fall*;—pale and yellow, roundish, medium size, Table and Kitchen, first quality, September, very productive, sweet, and pleasant flavour.

17. *Boxford*;—striped, red and yellow, flat, medium size, Table, first quality, September to October, very productive, excellent.

18. *Bourassa*;—russet and red, conical, medium size, Table and Kitchen, second quality, Oct. to Feb., a favourite Canada variety.

19. *Carthouse*;—dark, red and yellow, oblong, small size, Table and Cider, second quality, January to May, very productive, juicy, rich flavour esteemed for cider.

20. *Cos, or Caas*;—striped, yellow and red, oblate, medium size, Table, first quality, December to March, very productive, juicy, a favourite variety.

21. *Cathead*;—green and yellow, roundish, large size, Table and Kitchen, first quality, November to January, valuable for cooking and drying.

22. *Cumberland Spice*;—pale, and yellow, oblong, large size, Table, first quality, November to February, very productive, tender, and fine flavour.

23. *Craam, or Kraam*;—green and red, flat, medium size, Table and Kitchen, second quality, December to April, very productive, a favourite sweet variety.

24. *Conant's Red*;—red, Table, winter, rather mealy.

25. *Corse's Favourite*;—pale, and yellow, oblate, medium size, Table and Kitchen, first quality, August, very productive, fine sprightly acid flavour.

26. *Crow's Egg*;—striped, yellow and red, oval, medium size, Table and Kitchen, first quality, winter, juicy, remarkably dense, rich and excellent.

27. *Crab, Golden Beauty*;—yellow and scarlet, roundish, Preserves, September, very productive, of Canadian origin.

28. *Crab, Green*;—dark, and green, round, Preserves, October to January, very productive, will keep till late.

29. *Crab, Manning's Red*;—scarlet, roundish, Preserves, September, very productive, a New England variety.

30. *Crab, Montreal Beauty*;—yellow and scarlet, roundish, Preserves, September, very productive, of Canadian origin.

31. *De Nieve*;—pale, green and red, roundish, medium size, Table, second quality, Oct. to Jan., very productive, juicy, snow white flesh, musky sweet, a Canadian variety.

32. *Dansey's Winter Sweet*;—yellow and red, oblong, large size, Table, first quality, December to April, very productive, juicy, beautiful, excellent, and greatly esteemed.

33. *Doctor, Red*;—striped, yellow and red, flat, medium size, Table, first quality, October to January, very productive, juicy, very pleasant flavour.

34. *Domine*;—striped, yellow and brown, oblate, large size, Table, first quality, December to April, very productive, juicy, highly agreeable flavour.

35. *Dickskill*;—red and green, oblate, medium size, Table, second quality, Oct. to March, very productive, thick skin, and pleasant peculiar flavour.

36. *Earl's Harves*;—pale and yellow, roundish, medium size, Table and Kitchen, first quality, July, very productive, juicy, the finest flavoured, and earliest variety, may be used for pies in June.

37. *Fall Harvey*;—pale, yellow and red, ribbed, large size, Table, first quality, October to January, very productive, handsome, and very highly esteemed.

38. *Fallowater*;—red and green, conical, large size, Table and Kitchen, second quality, November to February, flavour assimilates to Newtown pippin.

39. *Gloucester White*;—yellow, ovate, medium size, Table and Cider, first quality, October to November, very productive, juicy, a southern variety, excellent flavour.

40. *Green Sweet*;—green and yellow, oblate, small size, Table and Kitchen, first quality, January to May, very productive, juicy, one of the latest spring apples at market.

41. *Golden Ball (of Maine)*;—yellow, ribbed, large size, Table, first quality, November to April, juicy, a favourite in the State of Maine.

42. *Greening, Rhode Island*;—green, roundish, large size, Table and Kitchen, first quality, November to March, very productive, juicy, excellent and greatly esteemed, a first rate variety.

43. *Greening, Hampshire*;—green, Table, first quality, October to March, very productive, a favourite in New England.

44. *Greening, New York*;—green, roundish, medium size, Table and Kitchen, second quality, December to March, very productive, good, perhaps synonymus.

45. *Haskell Sweet*;—Table, Oct., rather mealy.

46. *Hopkins*;—striped, oblate, large size, Table and Kitchen, first quality, November to March, valuable for kitchen and table.

47. *Jenning's Sweet*;—striped, yellow and red, large size, Table and Kitchen, first quality, October to November, very productive, fine for baking.

48. *Jersey Sweet*;—striped, roundish, medium size, Table and Kitchen, first quality, September to November, a good variety.

49. *Jonathan*;—red and white, conical, medium size, Table, first quality, November to May, very productive, juicy, handsome, first rate flavour, of the Spritzenberg class.

50. *Kenrick's Red Autumn*;—pale, green, and red, round, medium size, Table, second quality, September to October, very productive, juicy, sub-acid and fine flavoured.

51. *Kilham Hill*;—striped, yellow and red, ovate, medium size, Table and Kitchen, first quality, Sept. to Nov., very productive, juicy, flesh yellow and high flavoured.

52. *Knowles' Early*;—Table, August, rather mealy.

53. *Lippincott*;—striped, large size, Table, first quality, July to August, a beautiful and excellent Southern variety.

54. *Lovett Sweet*;—pale and yellow, round, medium size, Table and Kitchen, first quality, winter, rich and highly esteemed.

55. *Lyman's Large Summér*;—yellow, large size, Table, first quality, August and September, very productive, shy bearer till tree is large.

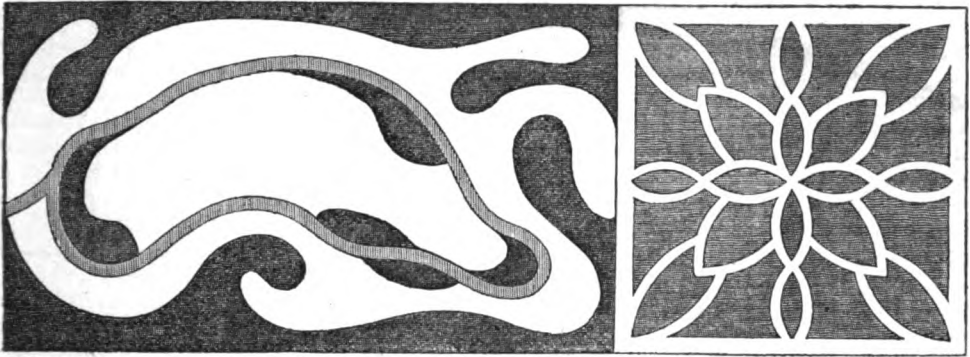
56. *Lyscom*;—green, yellow and red, oval, medium size, Table, second quality, October to January, very productive, mild and agreeable flavour.

57. *Mansfield large Red*;—red, large size, Table, December to April, an esteemed variety.

58. *Minister*;—pale, yellow and red, oblong, large size, Table, first quality, October to February, very productive, juicy, excellent.

59. *Morgan's Favourite*;—striped, conical, large size, Table, first quality, Dec. to March, very productive, handsome and valuable.

We shall give the remainder of the one hundred and fifty six that compose this list in a future article, some of the number are already known in England, but most of them are to the growers in England novelties. If the exporters of fruit send any of the sorts to England under their true names, we shall have a good opportunity of judging how far we may venture on others from this brief description. In the mean time, those who mean to venture upon a purchase of the trees upon the faith of our descriptive catalogue have no time to lose.



## LAYING OUT GARDENS.

THE fancy we had for giving plans of gardens adapted to the wants of our actual readers, has, to use a homely saying, "brought an old house over our heads:" nevertheless, as far as it is practicable, we will oblige our correspondents. It has been said in one of the papers, that landscape gardening cannot be taught, whereas, there is not a science which can be better defined and explained to the student, nor one in which there is more room for the display of taste. The great writers on landscape gardening have certainly not written as if they desired to teach others, for, generally speaking, when they wrote, the object seemed to be that of showing what they had done themselves on particular occasions, the great works they had achieved, and the means by which they were accomplished, had been often given, but no principles have been laid down to govern others in similar undertakings. Now, whether a man has to lay out a bit of ground, fifty feet by a hundred and fifty, or a space of half a dozen or half a hundred acres, there

are many ways of doing it, and we hardly know any thing more difficult than to work out any thing like a bit of natural scenery in a very limited space, but there is a way to make the best of it, and that way we endeavour to adopt. We have here a long strip of ground attached to a house which the owner wished to form into a lawn and shrubbery, with flowers in the clumps near the house, and a Dutch garden for flowers only at the end. We do not mean to say we should choose such a size and shape for ourselves, but that is no good reason why we should not make the best of it for those who have got it, and we trust our correspondent will be satisfied that he might have gone further and fared worse. Now here is one of the principles of Landscape Gardening carried out upon the smallest possible scale, both sides of the garden may be made appear like the borders of a miniature wood, while almost the entire space is to all appearance preserved and the real boundary concealed.

## GLENNY'S GARDEN PRACTICE.

## KITCHEN GARDEN.—MARCH.

**HORSE RADISH.**—Make beds of this useful root, unless it was done in the autumn. Cut pieces of the root about an inch long—these are for your sets, and are quite as good as crowns, if not better than crowns. Trench your ground fifteen inches deep, and every trench you complete lay in a row of three sets at the bottom, six inches apart. In filling up the trench, take care that the earth is well knocked to pieces, to allow of the plants coming up through it freely, and in a direct line, for any hard lumps or impediments would make the sticks of Horse Radish deviate from the line, and form themselves ugly and ill-

shaped. The distance from trench to trench will be much about the usual scale, for it is quite wrong to crowd this crop. There ought to be a good eighteen inches from row to row, and if there were more it would matter but little. A bed, however small, ought to be made every year, and the ground where it grows should be as regularly cleaned of all side shoots and bits of the plant as any crop I know of; for when more than one shoot comes from a set, it ought not to be allowed to grow. The clean growth which in good rich ground can be made by this mode of planting, would reconcile any body to the ex-

tra trouble, for if the ground be made tolerably fine, and it is naturally good, the sticks of Horse Radish will be as straight as an arrow, and, whether used at one, two, or three years old, will be handsome and clearer. Horse Radish, instead of being a coarse littery crop, in some ill-managed part of the garden, should be as handsome and as clean as a piece of Broccoli.

**POTATOES.**—Plant some in a warm border. Whole sets of the Ash-leaf Kidney, or any other of the early kinds. You may dig a trench or two, a foot deep, to hold eight inches thick of hot dung, head it in, put two inches of soil upon it, on this place your sets, nine inches apart, and draw down a full three inches of soil; should any very hard weather come, you may throw some litter on the top, and this should be done every night when they once show above ground; but as they come up, the earth should be drawn up their stems, so as to expose very little of the plant to the weather, and even that little should, in frost and of an evening, be covered with straw or peas haulm, or other litter. Be careful of any Potatoes already showing above ground, whether protected by glass or not, for frost is fatal to the crop, and in some sheltered places the early ones will, if the month of February was mild, be found to have shot a-head. Those who have Chapman's Kidney Potatoes in pits, where they should have been, in fact, since November, should take but few out at a time, and only open them in mild weather. They will be found so excellent at table, that, although we talk and write of early crops, a Potato is not worth growing out of its proper season, and there are thousands who could not by possibility tell the Chapman Potato, dug up and pitted in November, from the finest forced varieties, unless it were by their superior flavour and handsome appearance.

**CAULIFLOWER SEED** may be sown in rich ground, and in a warm situation. Those under glass must be tended carefully—they want all the air they can have on mild, warm days, and would be the better for a warm shower of rain occasionally, by lifting the glass off in windy weather they must be only tilted on the side away from the wind, and in hard weather, if such should come, they must not be exposed at all. If any remain too thick under the glasses, they must be planted out where they can be covered with other glasses, and not more than two under each glass, must be now left or planted, as they will have grown large, and, indeed, extra plants under glasses should have been removed last month. Earth up the stems well to strengthen as well as keep them warm. The plants in frames and under hand-glasses, or in warm beds un-

der mats—any of which may be called winter nursery beds—require air, whenever the weather is mild enough to let them have it; all dead leaves and disordered plants ought also to be removed. Great attention must be paid to rid them of slugs and other vermin, and they must not have too much wet. Towards the end of the month a quantity of the plants from these winter nursery beds may be planted out in a warm or open situation, in good rich ground—that which has been dunged and laid in ridges all the winter will be preferable—or if it have not been dunged, spread a good dressing over the surface, and merely dig it in one spade deep before planting out. Let them be planted in rows, two feet apart, and eighteen inches in the row. Prick out any seedling plants sown in a hot bed last month. It would be best to prick them out under glass, for they would be in great danger in the open ground, but you may form a bed, with a foot or eighteen inches of hot stable dung, and six inches of mould on it, and use hand-glasses if you have no frame.

**BROCCOLI.**—Sow some early purple towards the end of the month, in a piece of tolerably good ground, in an open situation.

**CABBAGE.**—Sow early and late cabbage seed. Plant out cabbage where they are to remain, early in the month. Let the ground if it have not been dunged during the winter have a good dressing, and dig in a spade deep. Let the rows be two feet apart, and the cabbages one, for every alternate plant may be drawn before the others require the room. As to the sorts of cabbage, so much depends on fancy that it is better to depend on the seedsman, but we have used the early York for years, and if true it is the best of all, though there are larger and handsomer kinds, such as the sugar-loaf, imperial, &c.

**SAVOYS.**—Sow the seed about the middle of the month, in an open situation.

**LETTUCE.**—Transplant from their winter quarters, leaving some at equal distances in their present situations, a foot apart, these being undisturbed will be certain; plant the others a foot apart in the rows, and eighteen inches between the rows. Sow all kinds you intend to use, choosing a sheltered spot, but keep them all separate.

**SPINACH.**—Sow and continue to sow a small quantity once a fortnight or three weeks. It is best in drills a foot apart. Sow thinly as when the plants come up they must be thinned to six inches apart in the row, they then grow rapidly and come to table in perfection. Winter spinach should be in full use, the outside leaves being gathered from time to time, and the inner ones left to grow.

**ONIONS AND LEEKS.**—Choose a portion of



the richest ground you have for an onion crop, for it can hardly be too rich; if there be any lack of strong dressing supply it, and on this spot sow your principal crop of onions; level your bed well, sow the seed evenly and not too thick, then head all over the bed so as not to leave a place untouched, and thus settle the seed in their places and rake it evenly, when this is done on a large scale it is rolled with a heavy roller. The leeks should be sown in a separate piece for planting out when large enough.

**JERUSALEM ARTICHOKEs.**—Plant in well dunged ground, eighteen inches apart, and two feet from row to row. This crop, like Horse Radish, is too often consigned to some ugly corner of the garden, and allowed to keep possession of it for years, by which means it is rare to find a good tuber of one, or a good stick of the other. They should both have good culture, and be kept as clear from themselves as from weeds.

**CARROTS, PARSNIPS, AND BEET.**—In digging the ground for the purpose of sowing these, although the spot may have been dug in the autumn or winter, let the operator take very thin spits, and drive the spade well down, breaking all the lumps fine, for unless the earth be well loosened, the top will not run down straight, but will grow crooked, or part into several, and come altogether ugly. The seed, then, cannot be sown too thin, so that they enable you to leave plants six inches apart every way, if they are to grow to perfection on the spot, but if the Parsnips and Beet are to be transplanted they may be thicker.

**ASPARAGUS BEDs** should be dressed by spreading well decomposed dung over the surface, and be then forked over, not more than three or four inches deep into the soil, lest the crowns should be damaged, the loose earth should then be thrown out of the alleys to the top and raked level. New Beds may be made in the ordinary way by marking out beds of three feet wide for two rows, or four feet wide for three rows; dig in three inches thick of good rotten dung, rake the top even, and drawing lines one foot from the edge of the bed, and one foot apart; lay Asparagus roots of one or two years old along these lines a foot apart, and in zig-zag form, that is not opposite each other, spreading out the fingers of the root like a star. Those marked two feet six inches for the alley on each side, and if you require it, make other beds the same way. Next dig the earth out of the alley, and cover the plants three inches, next put two inches thick of rotten dung, which you may cover with a very little more soil and so leave them. There is, however, at page 99, first vol. an account of very successful Asparagus growing,

quite worth any one's reading who wishes to excel. Seed of Asparagus may be sown on a rich compartment; to provide plants for yourself, sow in four feet beds thinly over the surface, and sift some of the stuff out of the alley over to cover it, but if the soil be moderately fine it will not require sifting.

**ARTICHOKEs** and **CORDOONS** are quite out of fashion, and well they may be, since there is such a choice of better vegetables, who for instance, unless for appearance, would eat an artichoke while sea kale were to be had? However, those who wish to grow a little of everything may procure a few suckers, and plant them in a well dunged piece of ground openly situate, in rows a yard and a half apart, and two feet six from plant to plant in the row.

**BEANS** and **PEAS**, a few more of each as your probable wants, and the success or failure of those previously sown dictate. I keep on with peas every fortnight or three weeks according as the weather favours me, providing only a few each time, unless indeed any of the former crops have failed, in which case I double the quantity, but no one can dictate or direct what quantity is sufficient, but those who are to consume them. Earth up all those which are up and growing and have not been already earthed; also go over the rows carefully after a frost to see that the Peas have not been raised out of the earth and exposed; and where Peas are forward enough and are earthed up for the last time, stick them even if they are dwarfs, for it is always a great protection against wind and frost.

**CELERY**, sow some if you *have not* done so, and sow more for a principal crop if you *have*; let the situation be warm, the soil well dunged, raked even, the seed sown rather thickly, and earth sifted over it so as to cover well and no more. If the weather prove dry administer water, and if there be harsh winds, keep them off by a covering of litter, matting, or some other material, until the plants have acquired strength: it is a good plan to use a garden frame and light.

**SALADS** OF ALL KINDS, keep up the succession as before directed, except that every sowing requires less care as to the situation of a place or the protection of the plants.

**HERBS**, seed may be sown, and slips and offsets of mint, thyme, sage, and other herbs planted in new beds, the kinds must however depend on the wants of the cultivator. Parsley and sweet marjorum may be sown as edgings to borders or in drills near the other herbs.

**NASTURTIUMs** sow under palings, or in any place where they may have support.

**CHIVES** as a substitute for onions in winter

may be parted and planted out to increase them.

**CAPSICUMS and TOMATAS, CHILLIES, &c.,** sow in a hot-bed, in pots.

**KIDNEY BEANS,** sow at the end of the month in the open ground in drills eighteen inches apart, and a foot apart in the drill.

**KALE** of several kinds may be sown for winter greens, in any spot from which when large enough they may be planted out. There is a variegated kind which looks very handsome as a crop, and is as fine as any for the table both in flavour and tenderness.

**RADDISHES** may be periodically sown in small quantities to succeed one another. If the plants of any previous sowing are too thick, draw some to give the remainder room. See that they are covered with litter of evenings, and instantaneous in frost; the turnip rooted as well as the short topped may be sown.

#### FRUIT GARDEN.

Upon the subject of grafting a few general rules should be kept in mind, and attended to, for then failure would be almost impossible, and these may be given in few words.

First. Whatever method you may adopt for joining the scion to the stock, whether it be by cutting a place in a large stump to fit on a small scion, or, being both of a size, you merely slope both, and splice them, or you may make one the form of a wedge, and make a place in the other to receive it—in short, make the join how you will, let the barks of both be perfectly level on one side, for unless the barks join well, no union of the parts can be secured, whereas, if the barks fit closely, the union is almost certain.

Secondly. Always cut your stock so as to have a bud or branch at the highest part, for as this draws the sap up to it, or, in other words, grows, above the actual join, then the vitality of the stock, even above the join, is secured, whereas, if there were nothing to lead or draw the sap, it is quite possible the stock might die back to the eye below it.

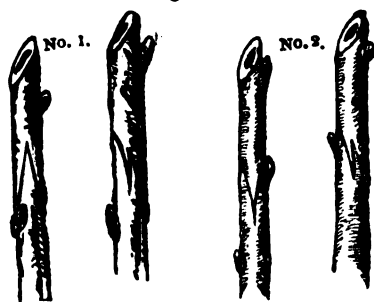
Third. When the fitting is managed well, after, no matter what fashion, tie the scion firmly in its place, and keep the external air and sun from drying it, by means of clay or cement, or grafting wax. In large operations, clay worked up to an easy working texture is generally used.

With regard to the first rule, that of filling the barks well together, the following is an example, and in the most difficult case, that of having to graft a very small scion on a very large stock, the circle represents the top of the stock, with a notch or gutter cut in it to hold the scion quite on one side of it. The small angular piece represents the form which

the bottom should be cut into, so as to fill this gutter, in fact, it would be something like a very thick backed knife. The upright piece represents the side of the stock in which the gutter is cut, and the next gives the scion and stock fitted ready to tie in the bark of the small twig, being quite level with that of the large stock.



As an example of the second rule, I give two modes of grafting—one wrong, the other right. The following cuts, No. 1,



not having the advantage of the leading bud would fail altogether, if the stock were to die down to the bud below, which is by no means an extraordinary occurrence. The cut, No. 2, shows how they should be done, and difference is manifest. There is no possible risk of the stock dying down, because the bud at the highest part of it secures its vitality.

The third and last rule, that of being careful to keep away the air, must be obvious; for the drying of the juices of the stock and scion would be fatal.

I do not recommend any particular mode of grafting as being superior to the rest, but those which I have given as examples are the principal modes I adopt, and I can hardly recollect to have had a graft in a hundred fail, and when I had, I could trace the cause to some oversight or neglect of the points I have urged. As to the hundred ways in which the teachers of gardening pretend to accomplish the same thing, I look upon them much more as the theoretical tricks of a bookmaker than the sober recommendation of a practical man. I have said in another place, and I repeat it here, that if a man had broken his walking-stick, and spliced it again, no matter how, the same means would do for a graft, so that the three rules I have laid down were attended to.

Almost all trees and shrubs may be grafted,

and, among other subjects, the Vine should not be lost sight of. In fact, those who wish to change the varieties of any fruit should recollect that they may reduce any tree to a stock, for the purpose of grafting on it a new or more desirable variety, and I have reduced an old Windsor Pear-tree, which was in fine condition, to seven branches, which formed stocks for seven new varieties of Pear, and in two years had the gratification of gathering six kinds of fruit, while a portion of the head was left to produce a few of the original. This is just the time, when those who have comparatively worthless kinds of any thing, no matter what, should select a vigorous branch or two to cut back, and graft better sorts on, and either considerably reduce, or altogether cut away the head of the old tree. For the methods of grafting the Vine or the Rose, see the Treatises on those subjects in former volumes of *The Gardener and Practical Florist*.

**PROTECTING TREES ON WALLS.**—No doubt the great evil which has arisen from the effectual covering of trees against wind and weather has been the exclusion of light, and on that account I have always declined covering at all, and be content to place such screens as would keep off the wind; but Whitney's transparent waterproof muslins and calicoes, made as cheaply as any one can buy the material without waterproof, may very materially alter my mind. As low as sixpence a square yard, may stuff be had, almost as light and quite as impervious as glass itself; curtains, therefore, of this may be used to choice trees with the greatest advantage. I should fasten the stuff with a bit of webbing on a wooden rail, about the size of two pantile laths, and hook this to the top of the wall by means of three or four staples and hooks, and make the curtain, as it were, long enough to reach the ground. The closeness at the top would prevent wet and hail from touching the trees, while the sides may have a gore to allow it to go close while in front sloped out, and the bottom may be fastened with weights. This is worth trying, though rather than use mats or nets, I should let them go without covering at all.

**PRUNING.**—I have done with, and so ought every body else to be, but if any be left undone, do it, especially those which have been left with all their wood for the purpose of using it for grafting.

**GOOSEBERRIES AND CURRANTS.**—Procure and plant all you require as soon as possible, especially of the new and good sorts. If you have done so already so much the better.

**PLANTING FRUIT TREES.**—Examine all your newly planted trees and bushes, see that they are firmly in the ground, that they are

made fast to their stakes, walls, or espalier frames, that the earth is close about their roots, and that they have been cut in all that is desirable.

VINES should have been made all right long since, but if any have been neglected till now no time must be lost.

#### FLOWER GARDEN.

**THE DAHLIA.**—The cutting off the shoots, and striking them, in continuation of last month's directions, will go on until enough has been raised, or the season of propagating is over. Some of the earliest struck cuttings will have grown tall enough to enable you, if desirable, to take off the tops, and treat them as other cuttings. Get them into pots one size larger as soon as the first are filled with roots. This will induce two side shoots to throw out, and as soon as these are large enough, one of them may be taken away to strike, and the other be tied up as a leader, thus every early plant will make three. The remaining stock of tubers not yet put to work should be set going at once, unless it be intended to plant them out as tubers, in which case they may be left to themselves, and if they do not start enough for planting out by the time they are wanted, throwing them, without potting, into a hot bed a few days will show all the eyes, and they may be cut up into as many pieces as there are eyes, and be planted like Potatoes.

**SEEDLING DAHLIAS** of last year, not bloomed, and intended to be bloomed the present year may be planted out towards the end of the month, a good six inches below the surface, and within a foot of each other, in rows, two feet, or, if you have plenty of room, three feet apart, for, as all the bad ones ought to be drawn out the instant they show their characters, the remainder are sure to have plenty of room. Sow Dahlia seed.

**AURICULAS.**—Examine your plants and see how far you are able to depend upon them for exhibition or blooming generally, for it has been for years a rule in all societies that no plant shall be exhibited which has not been in the shower's possession six clear weeks, therefore all who find any deficiency in any of their sorts or who are going to begin growing them, should order all they want early this month. I have often seen a nurseryman completely cleared out of a fine stock at the early part of March. In purchasing for shows the following should be had, as the majority of them are essential:—

**GREEN EDGED.**—Dickson's Matilda, Page's Champion, Lee's Colonel Taylor, Booth's Freedom, Stretche's Emperor Alexander, Smith's Waterloo, Hudson's Apollo, Dickson's Earl of Errol.

**GREY EDGED.**—Fletcher's *Ne plus ultra*, Waterhouse's *Conqueror of Europe*, Dickson's *Unique*, Oliver's *Lovely Anne*, Kenyon's *Ring-leader*, Syke's *Complete*, Hedge's *Britannia*, Grimes's *Privateer*.

**WHITE EDGED.**—Taylor's *Glory*, Popplewell's *Conqueror*, *Incomparable*.

**SELF-COLOURED.**—Redman's *Metropolitan*, Netherwood's *Othello*, Dickson's *Apollo*, Bury's *Lord Primate*.

**STAGE FLOWERS.**—For those who keep a stage of flowers, and grow a collection, the following may be added with advantage:—Cockup's *Eclipse*, Metcalf's *Lancashire Hero*, Gorton's *Champion*, Warris's *Blucher*, Franklin's *Bellona*, Gable's *Duke of Wellington*, Page's *Duchess of Oldenburg*, Pollet's *Highland Boy*, Pearson's *Badajos*, Moore's *Violet*, Page's *Lord Hill*, Smith's *Britannia*, Yates' *Lord Collingwood*, Foden's *Fair Rosamond*.

They must be now gently refreshed with water occasionally, and care must be taken that the top dressing be not washed out of the pots, or washed into holes. A warm gentle shower will not hurt them until the bloom begins to rise, after which the watering should be carefully administered without reaching the heart of the plant; but even when the bloom is rising we have known showers so gentle that the glasses could be taken off with safety and advantage, but a heavy rain would risk the damage of the flowers by washing them too hard. It is advisable when the weather is mild to occasionally remove all the plants out of the frame to sweep and clean it, and hunt out any slugs or vermin that may be harboured there. This might be done twice a month; cleanliness and frequent disturbance will be always found highly detrimental to the breed of any vermin. All dead leaves must be constantly picked off, for as the plant grows, the back leaves will turn yellow and rot on the plant if not removed in time. When you are getting in your new stock examine whether the plants are firm in their pots, thick and strong about the collar and tolerably well hearted, though if you go to a respectable man you will be generally well served; and when you have got in your new plants examine the degree of moisture there is in the soil, that you may know how to treat them as compared with your own, which otherwise may be more or less moist, and lead to dissimilar treatment, which above all things should be avoided; when watering, if you discover any plant moist when the others are dry, look to the cause, for it will be found that the drainage is imperfect, or a drip from the glass has saturated it, in either case the cause must be removed. If the sun comes out very hot the plants must be shaded with a mat during the hot part of the

day, and have the tops of the glass raised all round, with four pots or bricks, or clumps of wood, to keep a circulation of air. The transparent calico shades enough, and takes away no light.

**ANNUALS TENDER.**—Sow on a hot bed Balsams, Egg plants, Cockscombs, and other tender annuals for potting or planting out. It is the best way to sow them in pots. Sow also such hardy and half hardy annuals as you wish to come in flower early, such as Indian pink, China aster, *Nemophylla*, *Clintonia*, and others, to be placed in the borders in May. If you have no garden frame and light, get some hot stable dung towards the end of the month, and raise a heap or ridge eighteen inches high and three feet wide. Sow the ordinary annuals which are usually brought forward to plant out, in drills made with the finger. Ten weeks Stocks, China Aster, French Marygolds, and others, and even Pansey seed may be thus sown and greatly forwarded. If you have a hand-glass to put over any so much the better, but if not get a sort of temporary frame of hoops or straight pieces formed like the ridge roof of a house and mat them over, or use the transparent muslin or calico. Prick out into other pots any Balsams, Cockscombs, or other annuals sown last month; an inch or two apart will give them a very good start.

**HARDY ANNUALS**, such as Sweet Peas, *Mignonette*, Ten Weeks Stocks, Lupins, Larkspurs, *Convolvulus*, and others, that will lay in the ground till they can stand the weather, may be sown in the open borders as soon in the month as the weather will permit. Let them be well covered with the soil.

**CHRYSANTHEMUMS.**—Struck cuttings may be potted off singly into forty-eight sized pots, and kept under partial covering until the roots are established.

**CARNATIONS AND PICCOTEEES** require examining, disordered or dead leaves to be removed, the surface of the soil to be stirred, the frame cleansed and swept out. Prepare also rich mould for potting them in the blooming pots. Go and select any plants you may require to add to your stock, and especially if any particular variety look unhealthy or is scarce with you, recollect that buying now and buying after the bloom makes all the difference of the increase, which may be half a dozen pair, besides enabling you to bloom one healthy pair of the sort this year. The winds and wet of March are very unfavourable to these plants when exposed, therefore never pot them in their blooming pots until April, though you must prepare the stuff for it and the pots; the loam of well rotted turfs is the principal ingredient, one half of this, one quarter cow or horse dung rotted to mould, and

the other fourth a mixture of leaf mould and sand, more or less of either (according to the nature of the loam), to make it let the water freely through it, would be excellent stuff, though I should hardly be afraid of using the loam of rotted turfs alone. I prefer cow dung to horse dung, and if the loam be sandy I prefer it to being obliged to add sand.

**FLOWERS REQUIRING PROTECTION** I have said enough about. The Tulip requires the greatest care, for as I have observed in the treatise on that flower, I believe it impossible for the frost to reach the bulb (even before it starts into growth), without damaging the delicate and smooth edge of the flower.

**RANUNCULUSES AND ANEMONES** ought all to have been planted that were intended for show in June, but if any remain out of ground get them in as soon as possible.

**ROSES** should be planted out without loss of time.—See the treatises in the former part of this work.

**HOTBEDS OR OTHER CONTRIVANCES** used for forcing flowers should be supplied with others as former ones get forward enough to remove, so as to keep up a constant succession. Azalias, Rhododendrons, Kalmias, &c., may be purchased now at the nurseries ready potted, or be potted for the purpose, because they never depend on the new compost for any portion of their strength. They are removed with enough root and peat earth to them to actually bloom without a pot if it were necessary. Roses and other shrubs which do not come up with good balls of earth must be established beforehand in the pots, or at least have been potted in autumn. In buying the American Azalias you should get *Aurantia Major*, *Coccinea Major*, and *Ponticum Major*, and any of the large flowering Ghent varieties, or Waterer's large flowering kinds, but the first three are bright yellow, bright orange and bright scarlet, and are very pretty. The best and cheapest and most varied Rhododendrons are *Catawbiense*, of which Rollisson's of Tooting have many seedlings. Generally with respect to all garden operations look to all the former months directions from the first, as whatever may have been left undone should be done, especially in all that appertains to new operations, forming beds, borders, clumps, paths, box edgings, trenching, digging, dressing, planting fruit trees, shrubs, parting herbaceous plants and bedding them out, pruning, laying out grounds, in short in almost all things, all that has been said for the last five months would answer to be written over again as the directions for March, therefore those who have neglected until now anything that should or might have been done before, must recollect that a few days warm weather when it once

breaks, will deprive them of the opportunity of removing trees without danger, and doing fifty other things that would be then attended with risk.

#### PLANTS, PRACTICE, AND PERIODICALS.

**PROPAGATION OF GLOXINIAS.**—The following is a pleasing experiment:—amateurs, who possess a good pit or two, a greenhouse, and perhaps a small stove, or propagation-house, ought to find no difference. Let such persons possess themselves of a small plant, or pair of cuttings of the old *Speciosa*, with pea-green leaves, the variety with firmer brown-red tinted foliage; the *Caulescens* with reddish stems, from five to eight inches high, and firm textured, crenated, rich green leaves, (all of these produce flowers of the most exquisite blue, varying to indigo); and with *Candida*, bearing smaller white blossoms. If one of each of these cuttings be placed in a smallest sized pot, half filled with broken fragments of pots, and then, nearly to the brim, with black sandy heath mould, thrusting a round pointed stick through the soil till it reach the drainage, then trickling into the hole a thimble-full of writing silver sand, placing the cutting (taken at a joint under a leaf) upon the sand, filling the hole with sand, and making it firm at the heel, by pressure and saturation with water, it will, in a close frame, at a heat of sixty-five degrees, under glass, become a rooted plant very speedily. If the fellow cutting, prepared as the other at a joint, be inserted into a phial containing water to reach two or three inches above the bottom of the stem, be kept in a stove at any period between May and September, it will emit delicate and beautiful roots that have the appearance of threads of glass. A plant so formed may be potted off into heath-mould in a sanded hole with assurance of success. The roots, however, ought to be three quarters of an inch long, and the plant kept close for two or three days. I venture to assert that water is the best medium wherein to strike *Gloxinias*, to say nothing of the beautiful process exhibited during the development of the roots.

**THE BEAUTY OF PLANTS.**—Plants present an infinite variety, both in external form and internal structure, calculated to interest the enquiring mind; and combining beauty alike for the eye and the understanding, with utility in the great scheme of creation, must always be regarded as among the most delightful objects which man can contemplate and study. What were the face of earth without the vegetable creation?—a dreary waste, a desert—as in the arid sands of Africa, or the desolate regions round the Poles. Plants invest with charms the scenery of nature, and clothe with

beauty the world around us. Presenting a rich and variegated array of colours, and every variety in form, it is the vegetable creation that lends beauty to the landscape. It is plants which we admire in the verdure of the fields and meadows, in the flowers which enliven the banks and roadsides, in the trees and forests which adorn the prospect. We welcome reanimating nature in the buds and opening flowers of spring, and to these, expanded by a genial sun, the bright and joyous summer owes its bloom.—*Reid's Science of Botany.*

**STANDARD PLANTS.**—A standard plant is emphatically a beautiful object, if its due proportions be well preserved. It is only when these are violated—a thing which, unfortunately, too often happens—that it becomes a kind of deformity. The ordinary method of trimming the heads of standards, especially roses, so as to keep the shoots within very narrow limits, and to give them all the native inclination upwards, is extremely different from that which we have in view in advocating the preparation of plants after the standard fashion. It is by crippling and confining them in this manner that they are converted into insipid and characterless things. Our way of training them, however, would be to give the principal shoots greater freedom; to let them grow to a greater length; and then, by the weight of the branches, or by the assistance of strings to confine them downwards they would take a partially drooping direction, and assume an appearance which would be the very perfection of gracefulness.

**PAXTON v. LINDLEY.**—The *Root*, according to *Lindley's Elements of Botany*, p. 10, differs anatomically from the stem, "in the absence of normal buds, and of stomates; in exogens, of pith." We question the exclusive correctness of these theoretic assertions. It may be true that in those species whose roots are utterly incapable of producing suckers, there may exist no *normal*, that is, original or pre-organized germs, but in others, like the Rose, the Raspberry, Hazel-nut, Robinia pseudo-acacia, &c., which trace and wander extensively, protruding suckers in abundance, there must exist a system of buds, which contain the rudiments, at least, of perfect plants. It is known that if the cuticle of the Robinia root be wounded by a tool of any kind, a sucker will speedily be developed. *Neuchateau*, in his Treatise on the Acacia, established this fact years ago.—See *Withers on the Acacia*, pages 78-9, particularly. The Elm is seen to intrude its suckers to an extent that becomes a perfect nuisance in orchards and garden grounds, bounded by a hedge-row of this tree. Thus we are apt to generalize by observing merely a few solitary facts.—*Paxt's Mag. Bot.*

**PRESERVING ROOTS.**—After potatoes and other roots are put into the cellar, they should be kept from the light and air. Some cellars are provided with glass windows, by which they are kept light through the winter, but roots of all kinds will not keep so well in such cellars, unless they are put in close casks, boxes, bins, or pens, and covered up closely. If there be a small quantity of live earth with roots in general when they are put into the cellar, and they are kept in the same condition as when taken out of the ground, without becoming dry, they will remain sweet and good, but if they are dry and exposed to light or heat, they lose their life, sweetness, and good qualities. Put beets, carrots, and turnips, in close casks, with earth, first a layer of earth, then a layer of roots, and they keep well, and are as good in May as they are in the fall. These roots do not usually keep well without some care. The early turnip-rooted beet, early horn carrot, and the common English and early garden stone turnip. Use pure light earth a foot or so from the surface, that it may be free from manure or other impurities.

VALENTINE FROM BILL BLOSSOM,  
GARDENER, TO MISS ROSE BUDD, FLORIST.

Thou *Rose* of perfection, thou *Bud* of delight,  
Thou sweetest of *Cereuses*, blowing by night,  
Thou *Cactus* superb, about which florists rant,  
Thou nice little, neat little, *Sensitive Plant*,  
Thou delicate *Snowdrop* (that sounds rather chilly!)  
So I'll call you instead a dear *Duffdowndilly*;  
Thou *Columbine* graceful, that mak'st my heart  
chuckle;

Thou *Hyacinth* fragrant, thou sweet *Honeysuckle*;  
Not *London Pride* thou, but the pride of the nation,  
Thou primest of *Pinks*, thou incarnate *Carnation*;  
Thou dear *Flos Adonis*, thou bright *Amaranthus*,  
Thou *Peony* perfect, thou pet *Polyanthus*,  
Whose eyes are more bright than the beams of *Aurora*,  
And pierce through and through me thou great  
*Grandiflora*,

The wound they've inflicted is dreadful, exceeding,  
For my breast at this moment with *Love-ties-a-bleeding*, [winner,

Though *Heartsease* I've got in my bed, a prize-  
I have none in my bosom, as I am a sinner!  
Thou *Tulip* whose two lips seem crying "Come  
kiss us!"

If I might, I would give my best double *Narcissus*:  
But it's wrong to refer to such private particulars,  
So I beg you'll excuse me, thou pride of *Auriculas*!  
Though I cannot help thinking what pleasure—O  
gemini!

One embrace would now give me, thou dainty *Anemone*!

If I had not lost my Botanical Manual,  
I would go on much longer, thou dear tender *Annual*!  
But oh, come—(for this boldness a thousand of par-  
sons)

Oh come and take root in your own lover's gardens,  
From which during lifetime, you never shall miss  
him, ah;

Thou regular out-and-out *Speciosissima*!  
Then soon all his *Bachelor's Buttons* he'll sever,  
If you'll take your own faithful *Sweet William* for  
ever.



### FOUNTAINS IN GARDENS.

THE very strange notions which people have formed as to the proper size and style of fountains in gardens, induces us to prepare a number of sketches, which though rather rough will give a very good idea of various designs appropriate for different situations. It should always be remembered that fountains intended to play a moderate quantity of water aloft, should always be placed in situations where they have the advantage of a dark back ground of foliage, for, if otherwise, the effect of a slight stream of water is completely lost, whereas, when we have the green back ground or any dark back ground, the smallest drops are like white spangles between us and the trees. Then again if the intended situation of a fountain be open in a wide expanse like a lawn or park, or in front of a terrace, the body of water to be forced must be great to render it conspicuous, and the direction of the jets must be so as to keep the feature which the water presents low down; for, when it is forced high enough for the sky to be the back ground, the effect is completely lost, and unless you stand with the sun at your back you cannot distinguish it at all. Now, when a fountain is in a sort of dell with foliage and lofty trees half surrounding it, or forming a fine dark ground, no matter how minute the stream, nor how high it is thrown, nor what feature it may display, not a single drop is lost to the sight. Fountains may be contrived to suit any situation; but for an open space—the

centre of a large piece of water, the design should be bold and rocky, the streams of water at the top of the design should be directed through various apertures, outwards and downwards, but towards the lower portion of it there may be various jets directed upwards, so they be not too high, in such a case all the jets would be seen to advantage. As a specimen on a small scale we present a figure on a rock, jets of water issue from the mouths of two animals at the foot of the rock, and streams from two fissures. We shall next week give a very different design, for the reader is not always to imagine that a fountain is of necessity a jet of water springing up into the air; some may be made like a rock with water running out of numerous fissures; others may comprise monsters of the deep spouting forth water high into the air, and the science of hydraulics has been so encouraged of late years, that independently of the figure designed, there are inventions to make the water itself form extraordinary fantasies by means of jets which move by their own force the mechanical apparatus which they pass through.

### PLANTS FIGURED IN PERIODICALS FOR FEBRUARY.

*Stigmaphyllon Jatrophælium.* *Jatropha-leaved Stigmaphyllon.* This little plant is an inhabitant of rocky places near the fort of Salto, on the banks of the Uruguay, in the province of

Rio Grande de Sul, where it creeps over the surface of the soil. The whole genus is worth cultivation, and some of the species extremely handsome. They amount to forty-five, according to M. Adrien de Jussieu, and are found in most of the warmer parts of South America, especially Brazil. Probably the treatment given to melons will suit it during summer. If treated as a stove plant it requires to be potted in a compost, consisting of two parts sandy loam, and one of peat, in a rough state but well mixed together. During the summer months an ample supply of water should be given, and the atmosphere kept as moist as possible. In sunny weather the house should be slightly shaded. It may be propagated by cuttings in the usual way. — *Bot. Reg.*

*Ania Bicornis*.—*Two-horned Ania*.—*Gynandria Monandria*.—*Natural order, Orchidaceæ*.—This belongs to a little group of the Epidendrous section, of which *Bletia* is the type, and is nearly allied to *A. Latifolia*. It corresponds with the neighbouring genus, *Cytheris*. At first sight this plant, when in flower, resembles a starved specimen of *Eulophia macrostachya*. — *Bot. Reg.*

*Crinum Variabile*, var. *Roseum*.—*Rose-coloured changeable Crinum*.—This beautiful bulb flowered in April last with J. H. Slater, Esq., of Newick Park, near Uckfield. Its leaves are very long, and its gay rosy flowers most agreeably scented. Upon showing the drawing to the Dean of Manchester, the learned investigator of this difficult genus, he suggested the probability of its being either a variety of *Crinum variabile*, or a mule from *C. capense*, of which the gardens now contain so many. In Mr. Herbert's work is the following memorandum concerning *C. Variabile*: "This is the hardest known species; out of doors it preserves its leaves in winter longer than *Capense*, and it shoots earlier in the spring. Both this plant and *Revolutum* have a slender germen, but the idea conceived from Jacquin's plate by some persons, of its cells being monospermous, was erroneous. Its leaves are deep green. The flowers turn to a rich purplish red, so that flowers of two colours are always on the same umbel, as represented by Jacquin. The figure, if intended for *C. Variabile*, is quite incorrect." — *Bot. Reg.*

*Spiraea Reevesiana*.—*Mr. Reeves's Spiræa*.—This plant, which was introduced from China by Mr. Reeves, whose name it bears, is generally supposed to be the *S. Lanceolata* of Poirét. It is a handsome hardy sub-evergreen shrub, growing in any good garden soil, from three to four feet high. It is easily increased from cuttings of the small half ripened twigs during the summer or autumn. The cuttings should be put in sand, and covered with a bell

glass, and placed in an exhausted dung frame. It forms a spreading bush, and flowers freely in May and June. It probably would be quite evergreen in the warmer parts of England. — *Bot. Reg.*

*Genista Virgata*, *Twiggy Broom*.—Mr. Young, nurseryman, Milford, states that it is a handsome compact shrub, which resisted the hard winter of 1836-7. It was raised from the seeds sent by Mr. Webb from Madeira in 1825, was turned out in 1833 into the open border, and is now a very woody shrub. It is deserving a place in all shrubberies. In the garden of the Horticultural Society it grows about four feet high, and is capable of enduring the ordinary winters round London, if placed in a dry situation, and planted in a loamy soil. It is increased by seeds or cuttings of the young wood after midsummer. The cuttings should be placed in a shady situation, in light sandy soil, and covered with a hand-glass. It flowers freely in May and June, and forms a loose, rather spreading bush, rather thin of foliage. In the nurseries it is generally known by the name of *Spartium virgatum*. — *Bot. Reg.*

*Lissochilus Roseus*.—*Rose-coloured Lissochilus*.—A native of Sierra Leone, whence it was received by Mr. Rucker, in whose magnificent collection of *Orchidaceæ* it flowered in February, 1843. The leaves are broad, stiff, and plaited like a reed; the flower stem is between three and four feet high. The petals are of the brightest rose colour, set off with velvety-brown sepals, and a yellowish stain on the lip.

*Cereus Extensus*.—*Long-stemmed Cereus*, or *Torch-thistle*.—This has been long cultivated in the Royal Botanic Gardens of Kew, but had never flowered there, nor was its native country known to any one, till, in 1843, my friend, J. Gray, Esq., of Greenock, sent me the splendid specimen here represented, taken from a plant he had received from Trinidad; thus, at the same time, establishing its native country, and giving the opportunity of making so fine a blossom known to the botanical world by a good figure. How needful such figures are, is but too apparent from the confusion of synonyms, in cases where we have only recourse left to descriptions. Flowers very large, handsome.—*Curtis's Bot. Mag.* [This is really more handsome than the night blooming *Cereus*.]

*Dinema Polybulbon*; *Many-bulbed Dinema*.—This very small plant is a native of Jamaica. —Our figure was made from a specimen which bloomed in the Botanic Gardens of Glasgow some years ago. The stem is slender, creeping, about the thickness of a sparrow's quill, sending out roots from below, above bearing several elliptical, small, clustered pseudo-bulbs, partially sheathed with large scales at the base, and having at the summit two oblong-lanceo-



late, coriaceous leaves, blunt and emarginate at their apex. Flower solitary, peduncled from the axil of the pair of leaves. Peduncle one-third or one-fourth the length of the leaf, clothed with sheathing scales, tinged with red. Flower large, sepals and petals spreading alike.—*Curtis's Bot. Mag.* [One of the small orchidaceæ.]

*Ipomœa Crassipes*; *Thick-flower-stalked Ipomœa*, or *Bindweed*.—Being so far as I can find perfectly new. I have named it from the peculiarity of having the peduncle thickened upwards. It inhabits the elevated country about Macalisberg.—*Curtis's Bot. Mag.* [The plant appears to be a free flowering climbing plant, with purplish red convolvulus-like flowers all along it.]

*Erica Shannoniana*; *Lady Shannon's Heath*.—One of the most beautiful of the South African heaths, said to have been found by Masson in mountains at Kleinrivier, district of Swellendam, and to have been introduced to our gardens in 1826. Mr. Benthon observes that hybrid garden forms connect this with *E. Jasminiflora* and *E. Irbyana*. It was sent to us by J. T. Mackay, Esq., from his well-cultivated collection in the College Botanic Garden, Dublin.—*Curtis's Bot. Mag.* [This *Erica* is greatly similar to several of the white bottle-shaped bloomers, and the foliage is stronger than some, but sits close to the stem.]

*Tetranema Mexicanum*.—*Mexican Tetranema*.—A native, it would appear, of Mexico, introduced to our collections from Belgium, under the name of *Pentstemon*, from which genus Mr. Benthon has separated the above name and character. In the Royal Botanic Gardens it is treated as an inmate of the stove, and in that situation it flowers from November to May, each plant throwing up several flowering stalks, gay with purple blossoms. Slight as are the generic distinctions between this and *Pentstemon*, there is a something in the habit and aspect of the plant which distinguishes it to the eye.—*Bot. Mag.* [It flowers in bunches of small rosy coloured blooms, upon smooth stems, with foliage at the base, only broad and smooth.]

*Scaphyglottis violacea*.—*Violet Boat-lip*.—The genus *Scaphyglottis* was established by Poeppig and Endlicher, and five species enumerated, which are natives of Peru. All are peculiar in habit. Most of them have straggling stems, bearing pseudo-bulbs. *Bot. Mag.* [This is merely, a botanical curiosity, neither useful nor ornamental.]

*Lycaste Skinneri*. (*Mr. Skinner's Lycaste*.)—*Lycaste* is the name of a new genus, which has been separated from the old group, *Maxillaria*, and includes the well known and delightful *M. Aromatica*, with *M. Macrophylla*, *M. Cruenta*, and several others. The plant before us is,

indeed, generally called *Maxillaria Skinneri*; but it is now classed by Dr. Lindley among the species of *Lycaste*. *L. Skinneri* is happily designated by Mr. Bateman as the facile princeps of all known *Maxillarias*. "It has at length," says that gentleman, writing in the miscellany of the *Botanical Register* for 1842, "flowered in the collection of the Rev. John Clowes, with a vigour and beauty that could not be exceeded in its native haunts. The flowers actually measured upwards of six inches across, from the tips of the lateral sepals, while the latter are nearly an inch and a half wide in the broadest part. The colours of the flower are peculiarly delicate, the sepals being pure white, faintly tinged with crimson at the base; the petals of a more rosy hue, while the tip is almost covered with spots and streaks of the most brilliant carmine. The column, again, is pure white at the apex, and mottled with crimson spots at the base; while a number of woolly hairs are scattered on its under side. The habit of the plant is stately, and its growth free and vigorous, more nearly resembling *Lycaste Deppii*, than any other species." An excellent variety bloomed, about three months back, with F. Cox, Esq., of Stockwell, whose orchidaceæ are of the very highest order. Mrs. Wray's plant flowered in November last. The species has been brought to this country in great numbers by G. U. Skinner, Esq., after whom Mr. Bateman has named it. Its native place is Guatemala; and Mr. Brewster, the gardener to Mrs. Wray, informs us, that Mr. Skinner found it growing on rocky and mossy banks, in very moist places. Mr. Brewster, who has been particularly successful in cultivating it, grows it in an open basket, filled with moss and leaf-mould, in a temperature ranging from fifty to seventy degrees. No doubt much of its luxuriance is due to the use of leaf-mould; which, as we have before suggested in this magazine, is likely to prove a valuable medium for many orchidaceous plants. It should be kept freely moistened in summer, on account of its vigorous habits; but a cool dryish atmosphere is indispensable during winter.—*Mag. of Bot.*

*Luxemburgia Ciliosa* (*fringe-leaved Luxemburgia*).—This fine plant forms a very elegant shrub, from three to four feet high; but it is said to attain a height of eight to twelve feet in Brazil, where it also bears branches. "It was first detected," says Sir W. J. Hooker, "by Martius, in the diamond district, province of Minas Geraes; and subsequently, in the year 1841, by Mr. Gardner, in most peaty soil, in open places, growing with species of *Andromeda*, on the Organ Mountains, at an elevation of 5000 feet above the level of the sea. The genus was described by M. Auguste de St. Hilaire, under the name of *Luxemburgia*, though other botanists

have given it the title of *Plectanthera*. It contains four Brazilian species, known to travellers and botanists; but only the present one is, we presume, introduced to this country. It has been in British collections about eighteen months or two years, and flowered in several places during the season of 1843. We saw beautiful specimens from the Royal Botanic Gardens, of Kew; from Messrs. Lecombe, Pine, and Co., of Exeter; at the nursery of Mr. Knight, King's Road, Chelsea; and in others of the great nurseries. From Mr. Knight's plant our present drawing was prepared in July of last year. It is through Mr. Gardner that the stock now in England appears to have been obtained. From the top of the stem an upright spike of flowers issues, forming a sort of cone. The flowers are numerous, well disposed, large, and of a clear lively yellow. They last a considerable time, and are produced abundantly on plants not more than a foot high. The species require a stove temperature, and a moist atmosphere, with a rather enriched loamy soil.—*Mag. of Bot.*

*Dillwynia Clavata. (Club-shaped Dillwynia.)*

—Although not so gay a plant as some of its allies, or, at least, not so generally producing a profusion of bloom, it is really a superior species when properly managed; its seeming inferiority being due to its disposition to grow straggling when not artificially checked. Its habitude being stronger, more robust, and less branching than that of most *Dillwynias*, it requires pruning to keep it dwarf and symmetrical; and, to give this pruning its full influence, it should be done while the shoots are growing, and not in the autumn, winter, or very early spring. The soil in which it flourishes best is a very open fibrous heath-mould, mixed with a little porous loam and leaf-soil. The heath-mould should be kept in lumps of nearly an inch square, and be so thrown into the pot as not to lie too closely together. The great bane of all such plants as this, is sifting the compost and using the finer portion, and adding a quantity of sand to even this. The species must not be stinted for pot room, and should have the ball of roots placed pretty high in the centre of the pot. It is propagated readily by cuttings of the younger wood, and the spring prunings may usefully be employed for this purpose.—*Mug. of Bot.*

*Petunia Punctata (Spotted flowered Petunia).*

—Scarcely any tribe has undergone a more striking improvement in the hands of the hybridist; for, only a few years back, *P. Phænicea* and *P. Nyctaginiflora* were the principal sorts cultivated; whereas now there has been raised, chiefly from these, such an amazing quantity of beautiful varieties, that they defy all attempts at classifying, or even computing.

Some of these are conspicuous for their pleasing tints, and others have enormous flowers. But the best seedling we have yet seen, and which combines in itself large flowers, novel and delightful colours, and an exceedingly compact habit, is that here figured, and which, having got into notice under the name of *P. Punctata*, we now publish with that title, although we should have preferred a more popular one. The flowers of this variety exhibit a singular blending of colours. The principal tint is a deep blue, which passes in streaks and blotches into a white centre; the blue itself being likewise mottled with rosy crimson. The latter hue, it seems, gradually dies away, and leaves the flower of mingled blue and white till it perishes. All the varieties should have the soil in which they are grown somewhat enriched, as they are luxuriant in their habits. The shoots also require frequent stopping in the earlier stages of their progress.

—*Mag. of Bot.* [This is unquestionably the most decided novelty in the whole tribe, presuming the figure to be correct, and will, we hope, give rise to similar colours in better formed flowers, because, although more distinct from the original than hundreds of supposed or called species, it is the product of the florist who has taken the *Petunias* into his possession, and as the late Mr. Loudon said, "elevated it to the rank of a florists' flower;" this is of a better form than many varieties in cultivation. *The Florists' Journal* contains a figure of the last-mentioned flower, and a similar description. The figure is not so brilliant as that in the *Magazine of Botany*, and from that very fact we suspect it is more like the original.]

*Robinia Hispida. — Hispida rose Acacia.*

The *Robinia hispida* or *Rose-Acacia*, is tolerably well known; but from its brittleness is often broken and destroyed. In the *Arboretum Britannicum*, vol. 2, respecting them it is said, "They form singularly ornamental shrubs for gardens; but as standards or bushes, they can be only planted with safety in the most sheltered situations. *Robinia hispida* is often grafted about one foot above the surface of the ground; and, when the plant is not trained to a wall, or some kind of support, it is almost certain, after it has grown two or three years, to be broken over at the graft. A preferable mode, therefore, for dwarfs, is to graft them on the root, or under the surface of the soil. In purchasing plants, this ought always to be borne in mind.—*Maund's Bot. Gard.*

*Ophrys Apifera. — Bee Bearing Orchys.*

This plant, usually known as the *Bee Orchis*, has always been an object of admiration, as one of our native plants. Its spontaneous distribution seems to be wholly dependent on geo-

logical circumstances. In districts where chalk or limestone prevail, it is not uncommon; but is scarcely ever met with elsewhere. It is best kept in a pot, in peat and loam, mixed with a good portion of coarse sand; should have a shady situation, never be kept over moist, and have protection from frost in April and May. After flowering, keep it nearly dry till the following spring; then re-pot and water it more freely.—*Maund's Bot. Gard.*

*Epigæa Repens.*—*Creeping Epigæa.*—The prostrate habit of this genus has obtained for it a corresponding name. *Epigæa* is derived from the Greek  $\epsilon\pi\iota$ , upon;  $\gamma\alpha\iota\alpha$ , the earth. Its specific name, too, further recognises its humble growth. Although a very lowly shrub, it is one well deserving of cultivation. It is a native of stony places, on the sides of hills beneath the shelter of stronger subjects; sometimes courting the shade of lofty pines, where man has never intruded the plough or the spade to disturb it of aboriginal possession. This small shrub may be admitted even to the herbaceous department, without violence to good taste. It is but idle to institute laws to exclude shrubs from amongst herbaceous plants, in the flower garden; or herbaceous plants from every part of the shrubbery. Nature establishes no such principle. As well as our present white-flower *Epigæa repens*, a red flowered variety was published in Sweet's Flower Garden, in 1837, but which, it may be feared has been lost to the country. It is even a prettier plant than the present subject. The treatment of each will be the same; that is, they should have a rather shaded and sheltered situation, be planted in sandy peat, and have their trailing stems pegged down, as they advance in growth, to prevent their being blown about and injured. This treatment affords also another advantage, some of the branches will strike root, and may ultimately be separated for increase. In severe frost a mat thrown over it would prevent injury from the alteration of freezing and thawing.—*Maund's Bot. Gard.*

*Acanthus Mollis.*—*Soft Acanthus.*—Of this plant mention may be found in the old pharmacopœas, under the name of *Brank-ursine*, both its leaves and roots have been employed medicinally, possessing much the same qualities as Marsh-mallow; that is, emollient and demulcent. Some authors have given to this plant the memorable distinction of having originated the Corinthian Order of architecture. The *Acanthus mollis* is best suited to a situation in front of the shrubbery, where herbaceous plants are admitted. It should remain undisturbed for several years, when it will throw up strong undivided stems of flowers, from three to four feet high, of a showy character.—*Maund's Bot. Gard.*

#### THE PROPERTIES OF THE CUCUMBER.

HOWEVER awkwardly our engraver may have formed the diagram of a Cucumber to illustrate our description, we have had the strongest proofs of our correctness that could by any possibility have presented themselves. At the Ipswich Society, the rulers venture to dispute the rules we have laid down; they call length the great feature, not limited at all; whereas, we insist that nine diameters long would be perfection as to length, and that longer would be a blemish. At their last Show, the best brace were  $1\frac{1}{2}$  inch in diameter and  $15\frac{1}{2}$  inches long, a quarter of an inch, or one sixty-third part short of our standard; the second best brace were  $1\frac{3}{4}$  inch diameter and 16 inches long, a quarter of an inch, or one sixty-third part above our standard; the third brace were much longer in proportion, that is, longer and thinner. Now, in their own accounts of the Show, the first and second brace are described as in all other respects alike, but the handsomest has the higher prize, and it proves a quarter of an inch shorter than our standard would have been; and the next best, in all respects but the length, equally good, has the second prize, and is a quarter of an inch over. What does this say, but that a quarter of an inch under nine diameters is better than a quarter of an inch over? Another favourite crotchet of the Ipswich Society, is to have cucumbers ribbed—ours is to have them smooth. Both first and second prizes are described as slightly ribbed. This looks like improvement.

#### THE POLYANTHUS.

So many attempts have been made to grow this plant near London without any considerable success, that people are deterred from cultivating, notwithstanding the absence of any physical cause for failure. We have often seen the common sorts of the Polyanthus thriving in ordinary borders, and there is no peculiarity which changes the nature of those which are prized. They are, if any thing, more robust than the common ones; they grow stronger, and we see no good reason why the prize varieties should not be grown as well as the common sorts. What is the treatment of the prize Polyanthus round the metropolis? It is potted like the *Auricula*, and nursed first into weakness and then death. But to do any good with the Polyanthus, it should be grown in good strong, though not heavy soil; well dunged, well drained, sheltered from cold winds, but not deprived of air. They should be grown in a walled or high-fenced garden, so that no sweeping north or east wind should cut them; but they are anything but tender.

They might be grown nine inches apart, in rows, and a foot from row to row; parted directly they are out of bloom, so as to have but one heart to a plant, and then planted out at once. They should be continued there all the winter, and even until they bloomed, when they should only be potted up for showing; nor do I believe that any pot culture equals this mode of growing them. But be it remembered, that many in the country keep their principal stock in pots, and that they do grow them in health and bloom them well; so that our mode of treating them is not necessarily the only one, although we never saw them grow so well in pots as we have grown them in the ground. But there are many things to consider in the culture of show flowers. In the first place, there should be but one heart to the plant encouraged; and if there be great strength exhibited in one, it is better to remove any smaller ones that may come round it, by cutting out the early growth, that all the strength may go to the bloom. We have, in an early part of the work, given the properties of the *Polyanthus*; but it should be understood, that a fine variety becomes insignificant with a bad growth, and therefore, that some regard should be had to the state of the plant, when you judge from the bloom. This is applicable to persons who would buy in plants now. People are very seldom inclined to send out large strong plants, and the bloom ought to be picked off without being allowed to perfect itself, at all unless the plant be very strong. In general, it is better to pay a higher price for plants that are large enough to show; and if we had them in to-morrow, we should plant them out, if the pot were at all full of roots, or the roots had begun to reach the sides of the pot; we should plant the ball entire. Take a bed or border made up of half loam of rotted turfs and half decayed cow dung well mixed together. In this plant out the balls entire, and water to settle the earth about the balls; there await the bloom, shading it in the heat of the day as soon as the colours show, and until the flowers are quite open. When you have to show them, take a size larger pot than they were in before. Saturate the ground with water, and carefully lift them with a trowel, without bruising any of the roots; and when potted, stand the pot a few minutes nearly up to the rim in water. The flowers will stand firmly until after show, when the bloom should be picked off and the plant once more put in the ground; and a plant that has never been in a pot will not suffer so much as one which has. We should like to see a few collections grown near London.

## CEMETERIES.—NO. 1.

## SOUTH METROPOLITAN, NORWOOD.

NATURE has here abundantly favoured this spot in the diversity of surrounding scenery, and art has lent its resources to improve and adorn; of which the chaste and classic buildings by Mr. Piper, and the tasty arrangements of Messrs. Buchanan and Olroyd, may be adduced as conclusive instances. The ground enclosed is above forty acres, situate just against the sixth mile-stone, and exactly opposite St. Luke's Church, Norwood, which it may be remembered, by those accustomed to travel that road, stands between the two roads which diverge at that point.

The ground is enclosed with a brick wall of considerable thickness, and rather more than twelve feet high, having a plinth and coping of Portland stone, broken at intervals of about thirty feet by piers, which rise above the wall, and which bearing embellished caps, give to the whole a rich and substantial, and at the same time a picturesque appearance, very much at variance with what would be expected from the appearance of a brick-wall, rather more than one mile in length. The enclosure is also varied at those points where the interference of a dead wall would be most objectionable, by panels of iron-railing of the same height as the wall itself, which being intersected by tracing and foliage of a rich and appropriate character, has a very imposing effect.

The lodge and entrance gate-way adjoining the Norwood-road is a picturesque group of buildings, the lodge itself having the pleasing character of the domestic architecture of the middle age, which, with its towering chimney shafts, cut gable ornaments, and projecting buttresses, forms an interesting object. The gateway, itself of a harmonising character, is surmounted by an elaborate carving of the arms of the See of Canterbury on one side, and of Winchester on the other. Passing through this gateway, the visitor cannot fail to be struck with the natural advantages of the ground, and the beauty of the planting and surrounding scenery. From the entrance the two fine chapels with their attached cloisters, form a striking object, while the rich foliage of the Penge woods, as a back ground, increase the effect, and the beautifully varied and cultivated grounds of the cemetery complete a very rich landscape. The buildings stand upon a considerable elevation in the ground itself, each facing that portion to the services of which it is appropriated. The Episcopal chapel which fronts the visitor on his entrance into the ground is a richly decorated building of the Gothic style, having an elevation consisting of two lofty lanthorns towers, with a large centre arch

between, forming a fine open entrance to the building, and flushed by a range of cloisters with appropriate arches and pinnacles, extending to a length of about seventy feet on either side. The towers and buttresses are in a richly decorated style, which is quite sustained throughout all the external elevation and the interior arrangements. The effect of the interior is both rich and chaste, and although there is no violent departure from ancient models, still there is by no means a servile imitation. At each end is a lap and elegantly painted window, and the sides are decorated with corbels and other ornaments, the most striking part being the decoration of the lower portions, which are so arranged as to give the rich effect of the stalls of our collegiate chapels. In the centre there is an apparatus for lowering the coffins into the catacombs below, these occupying a space of 200 feet by 75 feet, and are very lofty, airy, and dry, being covered with asphalte. The Dissenters' chapel, though somewhat smaller in its dimensions, stands with singular advantage in reference to that portion of the ground to which it belongs, being also on the summit of a gentle elevation, towards which all the ground generally tends. The elevation of this building differs considerably from that of the Episcopal chapel, but is quite as elaborate and characteristic. The centre is occupied by a large window, under which the great entrance doorway passes; and the small vestry and approach to the vaults, form on each side a half octangular projection, from which two large and bold buttresses rise on each side, these again are flanked by buttresses decorated with carved pinnacles angularly to the building, and this building has also cloisters projecting on each side. The windows in the flanks of this chapel are of a singularly neat proportion and arrangement, and the chapel itself stands upon an extensive range of catacombs.

From the natural advantages of the ground itself, the various monuments show to great advantage, and so much care has been bestowed upon the surface drainage, which has been done under the superintendence of Mr. Buchanan, that graves have been opened to a depth of twenty-five feet, and found perfectly dry. A large sewer, of six feet width, runs through the centre of the ground, and insures this very desirable advantage. The skill which has been shown in the arrangement of the ground is so great, that the effect of it is that of a highly cultivated pleasure-ground, and the different shrubs are in a very healthful state. The public voice has already been distinctly expressed in favour of these cemeteries, and prove that they are alive to the absolute necessity of the metropolitan church-yards be-

ing relieved from sources by which the atmosphere is so largely infected. It may be stated that the architect of the works is William Tite, Esq., F.R.S.

#### TREES.—CLASSES, GROWTH, LONGEVITY.

TREES may be considered under two heads:—first, those trees, which on account of the mode of their growth, cannot live beyond a certain period; a second, those whose mode of growth admits of the possibility of their existing an indefinite period.

The first mentioned class increase, when young, in diameter rather than in height, until a certain magnitude is attained, when they shoot up a stem, the diameter of which is never much altered. This is the mode of growth of the palm-tribe of trees, and other intratropical plants; and it prevents them from attaining a great longevity. All the new woody matter produced by the leaves is insinuated down the centre of the stem. The effect of this is the displacing of the pre-existing woody matter, which is pressed out towards the circumference. By the continuance of this process, the stem becomes so compressed that it is not capable of any more compression. Thus there is no space left for the introduction of new woody matter from the leaves; the consequence is, that the full action of the functions of the leaves is prevented; the tree, therefore, perishes, because its vitality is dependent upon the full action of all its parts. Trees belonging to this class cannot exist beyond a definite period, which is seldom found to exceed 200 or 300 years.

The other class of trees, increase principally in length, when young. They afterwards extend in diameter by means of longitudinal fibres being insinuated by the leaves under the bark, on the outside of the wood. The bark being capable of indefinite extension, it is evident that nothing independent of accident can put an end to the existence of such trees. Eminent botanists see nothing unpalatable, and no one can point out anything impossible, in the idea, that some trees of this kind at present existing may have been spectators of the flood.

The age of trees belonging to this class can be ascertained by counting the number of rings into which they are divided. Every one of these rings must have been produced in neither more nor less than a year; and this is the ground upon which botanists have arrived at such precise conclusions concerning the longevity of some trees. We shall notice the ages of a few ascertained in this manner.

Decandolle mentions an elm 335 years old; a cypress about 350; a cheirostemon, about 400; an ivy, 450; a larch, 576; an orange tree, 530; an olive tree, 700; an oriental plane,

720; a cedar of Lebanon, about 800; oaks, 870, 1080, and 1500; limes, 1076, and 1147; yews, 1214, 1458, 2280 and 2588.

At Ellerslie, the birth place of Wallace, near Paisley, there is an oak which is said to have concealed under its branches Wallace and 300 of his followers. However doubtful this may be, it is certain that the "Wallace Oak" cannot be much less than 700 years old.

Eight olive trees still grow in the garden of Gethsemane, near Jerusalem, which can be proved to have been there more than 800 years ago, and which are alleged to have been witnesses of our Saviour's agony.

Such great antiquity, however, is small when compared to the age of the baobab, some specimens of which, growing in Africa, Adanson found to be 5000 years old! Even this great age is surpassed by that assigned to the taxodium by Decandolle, who makes some specimens which he discovered in South America to be 5840 years old! Adanson ascertained some banian trees to be of equal antiquity.

#### THE METROPOLITAN SHOWS.

THE approaching exhibitions of the metropolis begin to interest those persons who in general manage to show; and, perhaps, for the last three or four years, there have not been so much actual stir among cultivators round London. The principal are, three of the Royal Botanical Society, Regent's Park; three of the Horticultural Society, Chiswick; and five, we believe, of the South London Floricultural Society, Kennington. Of the first, there was such unequivocal evidence of liberality, and this inspired such unbounded confidence among exhibitors, that it is supposed by many who have the best opportunities of knowing, that if the weather should prove at all favourable, the exhibitions of the present year will surpass anything that has appeared in the metropolis since the two memorable exhibitions at Lord's Cricket Ground and Cremorne House—the latter of which caused a total change in the management of public shows. The fact of the council consulting the majority of exhibitors of last year, as to the choice of judges for the present, is of itself enough to show that the council wish the judges to be totally uninfluenced by the society; and it also totally precludes the possibility of grumbling, whatever may be the nature of the awards. With regard to the Shows at Chiswick, they will doubtless be much the same as usual, except that we think the May Show must of necessity be bad for many kinds of plants which are out of flower before the middle of the month. The June Show may be better; but the complaint of the growers is,

that the days are too late for one set of flowers and too soon for those of the next month. Nevertheless, the Fellows of the Society are so numerous, that it will be always able to command a respectable exhibition. There is, however, a notice which has shaken the confidence of the best showers. In awarding the prizes, regard is to be had to plants having been exhibited before in the present season. This has been interpreted, we hope erroneously, into a prohibition of showing at Chiswick any plants previously shown at the Regent's Park. This kind of regulation would spoil both Shows, because it would prevent gardeners from showing their best plants at both, and thus divide the best specimens, some choosing to exhibit at one place and some at the other. Let us hope those fears are groundless, and that the prohibition only extends to the showing of the same specimens twice in the season at the same place. The South London florists have a great responsibility resting with them. There is much to improve in their mode of choosing judges, and many have been uncharitable enough to believe that there was considerable management in the distribution of their prizes, more especially as the most respectable members of the committee have generally evinced the most indifference in respect to that part of the business, while in fact it is the most important of all; and the evil has been a hurried appointment at the latest moment, and too often an unsatisfactory award. On this account, it would be well for the Society if they settled that point among the earliest of their arrangements, and let the world know who are to decide the fate of the exhibitors at each Show. It cannot be concealed, that at one time the prizes for fruit and vegetables, at another those for plants, another those for cut flowers, have been most unsatisfactorily distributed, and leading exhibitors have been offended. It is to avoid similar results that the Royal Botanical Society, Regent's Park, consulted the exhibitors by circular, and their answers, they would use as balloting lists and determine upon their judges by the majority of votes; and it would be well if the South London Floricultural Society were to do so too. The first two Shows, we believe, take place at the Horns Tavern; that is those in April and May; those in June, July, and August or September, are held at the Surrey Zoological Gardens.

#### THE EARLY DAYS OF LANDSCAPE GARDENING.

Mr. WALPOLE, afterwards Lord Orford, in the fourth volume of his *Anecdotes of Painting, &c.*, in *England*, gives a most interesting his-

tory of the rise and progress of Gardening as a science, and of the improvements which it had undergone up to the period in which he wrote. Upwards of half a century has since elapsed, within which time we all know to what the art has been brought. This, however, ought not to make us forgetful of the obligations which we owe to the skill and genius of our predecessors.

"Having thus cleared my way," says Mr. Walpole, "by ascertaining what have been the ideas of gardening in all ages, as far as we have materials to judge by, it remains to show to what degree Mr. Kent invented the new style, and what hints he had received to suggest and conduct his undertaking.

"We have seen what Moor Park was, when pronounced a standard. But as no succeeding generation, in an opulent and luxurious country, contents itself with the perfection established by its ancestors, further perfection was still sought; and improvements had gone on till London and Wise had stocked their gardens with giants, animals, monsters, coats of arms, and mottoes, in yew, box, and holly. Absurdity could go no further, and the tide turned. Bridgman, the next fashionable designer of gardens, was far more chaste; and whether from good sense, or that the nation had been struck and reformed by the admirable paper in the *Guardian*, No. 173, he banished verdent sculpture, and did not even revert to the square precision of the foregoing age. He enlarged his plans, disdained to make every division tally to its opposite; and though he still adhered much to straight walks with high clipped hedges, they were only his great lines; the rest he diversified by wilderness, and with loose groves of oak, though still within surrounding hedges. I have observed in the garden at Gubbins, in Hertfordshire, many detached spots, that strongly indicate the dawn of modern taste. As his reformation gained footing, he ventured further, and in the royal garden at Richmond, dared to introduce cultivated fields, and even morsels of a forest appearance, by the side of those endless and tiresome walks that stretched out of one into another without intermission.

"But the capital stroke, the leading step to all that has followed, was (I believe the first thought was Bridgman's) the destruction of walls for boundaries, and the invention of fosses—an attempt *then* deemed so astonishing, that the common people called them *Ha! Ha's!* to express their surprise at finding a sudden and unperceived check to their walk. One of the first gardens planted in this simple, though still formal style, was my father's at Houghton. It was laid out by Mr. Eyre, an imitator of Bridgman. It contains three-and-

twenty acres, then reckoned a considerable portion.

"I call a *sunk fence* a leading step, for these reasons. No sooner was this single enchantment made, than levelling, mowing, and rolling followed. The contiguous ground of the park, beyond the sunk fence, was to be harmonized with the lawn within; and the garden, in its turn, was to be set free from its firm regularity, that it might assort with the milder country without. The sunk fence ascertained the specific garden, but that it might not draw too obvious a line of distinction between the neat and the rude, the contiguous out-lying parts came to be included in a kind of general design; and when nature was taken into the plan, under improvements, every step that was made pointed out new beauties, and inspired new ideas.

"At that moment appeared Kent, painter enough to taste the charms of landscape, bold and opiniative enough to dare and to dictate, and born with a genius to strike out a great system from the twilight of imperfect essays. He leaped the fence, and saw that all nature was a garden. He felt the delicious contrast of hill and valley changing imperceptibly into each other; he tasted the beauty of the gentle swell, or concave scoop, and remarked how loose groves crowned an easy eminence with happy ornaments, and while they called in the distant view between their graceful stems, removed and extended the perspective by delusive comparison.

"Thus the pencil of his imagination bestowed all the arts of landscape on the scenes he handled. The great principles on which he worked were, perspective, and light and shade. Groups of trees broke the too great uniformity or extent of a lawn. Evergreens and woods were opposed to the glare of the open country. When objects were wanting to animate his horizon, his taste as an architect could bestow immediate termination.

"But all of these beauties he added to the face of this beautiful country, none surpassed his management of water. Adieu to canals, circular basins, and cascades tumbling down marble steps, that last absurd magnificence of Italian and French villas. The gentle stream was taught to serpentine, seemingly at its pleasure, and where discontinued by different levels, its course appeared to be concealed by thickets properly interspersed, and glittering at a distance where it might be supposed naturally to have arrived. The living landscape was chastened or polished, not transformed. Freedom was given to the forms of trees; they extend their branches unrestricted; and where any eminent oak or master-beech had escaped maiming and survived the forest, bush and

bramble were removed, and all its honours were restored. Where the united foliage of an ancient forest extended wide its undulating canopy, and stood venerable in its darkness, Kent thinned the foremost ranks, and left but so many detached and scattered trees as softened the approach of gloom, and blended a chequered light with the thus lengthened shadows of the remaining columns.

"That Kent's ideas were but rarely great, was in some measure owing to the novelty of his art. It is too true, that the features in his landscapes were seldom majestic. His clumps were puny; he aimed at immediate effect and planted not for futurity. One sees no large wood sketched out by his direction. Nor are we yet entirely risen above a too frequency of small clumps, especially in the elbows of serpentine rivers. Kent's last designs were in a higher style, as his ideas opened on success. The north terrace at Claremont was much superior to the rest of the gardens.

"A return of some particular thoughts was common to him with other painters, and made his hand known. A small lake, edged by a winding bank, which scattered trees that led to a seat at the head of the pond, was common to Claremont, Esher, and others of his designs.

"Having routed professed art—for the modern gardener exerts his talents to conceal his art—Kent, like other reformers, knew not how to stop at the just limits. He had followed nature, and imitated her so happily, that he began to think all her works were equally proper for imitation. In Kensington Gardens he planted dead trees, to give a greater air of truth to the scene, but he was soon laughed out of this excess. His ruling principle was, that *Nature abhors a straight line*. His mimics—for every genius has his apes—seemed to think that she could love nothing that was not crooked. Yet so many men of taste of all ranks, devoted themselves to the new improvements, that it is surprising how much beauty has been struck out, with how few absurdities.

#### SIR JOHN MURRAY'S THEORY AND HIS CHEMICAL FERTILIZERS.

A WARM temperature accelerates the growth of seeds, and promotes those chemical and vital changes requisite to convert the nutriment of the seeds into starch, gum, and sugar, to nourish the young *germ* in its infancy, when it has as yet no mouth or stomach either in root or leaf, earth or air.

The hastening of germination is very valuable on many occasions, but in particular to turnips; when the young buds of these plants are tardy, the seed lobes coming up, as *rough*

*leaves*, are often eaten by the fly. This is fatal to the crop, but if suddenly pushed into the smooth leaves, the chances are very favourable.

In order to promote this general temperature, or to expedite the budding of potatoes, turnips, and culinary crops, we have contrived to arrange our materials, so that when both classes are kept separately, there is no loss of fixed air, galvanic influence, or waste of temperature, as is the case with those who make their compounds in the chemical works. But by our method of keeping the two series separate, until their action is wanted, we obtain whatever advantages may be derivable from the extrication and diffusion in the mould, of a considerable quantity of latent heat, which heat communicates more or less warmth to the mould or clay under the newly sown seed, so that we begin our chemical operations in the cauldron of mould, by first generating the *heat*, then the *fixed air*, and lastly, the *series of saline ingredients*, all in the identical spot where *heat, fixed air, and saline ingredients*, are required.

A single experiment will serve to illustrate these desirable points:

If you mix a handful of the acidulous, or red cask, with four or five times its bulk of damp mould in a bason, and then mix in another handful of the alkaline or *dark cask*, you will find the thermometer rise (as you see) *ten or fifteen degrees in as many minutes*.

Although this creation of heat cannot be expected to last more than a few days, in drills, or under dibbled seeds, yet the idea deserves further extension in practice. By dusting a little plain mould over this warm compost, or mixture, you can sow seed on the mould, and have a temporary *hot-bed*, ready in a moment. Heaps or beds for raising mushrooms from spawn are now made hollow, and if suddenly cooled too low, a compost of this kind might be speedily introduced, where it would be too tedious to wait for the heating of stable manure. After the heat is communicated, the basket of Fertilizers is withdrawn from the hollow centre of the hot-bed, and more of the warming mixture may be introduced as required.

#### THE ADVANCEMENT OF HORTICULTURE

##### PROPERTIES OF VEGETABLES AND FLOWERS.

CONSTANT improvement in progressing from the time a plant is introduced, if there is sufficient merit in it to make it worth cultivation, and that quality which would improve it is pointed out sufficiently clear, or is without pointing out obvious. Thus a cabbage with a small heart originally induced people to try



all they could for larger, and by saving seed from the largest from time to time the breed was improved, and by continuing to save it from those which approach nearest what we want, we continue to improve it, so with regard to another property, obvious enough to all, the early perfecting of its growth; a cabbage which somewhat precedes the rest of its companions is so desirable, that no opportunity of seeding such a specimen should be lost, by these means, often repeated, no doubt early cabbages were produced, and nothing can be more desirable than to improve this quality still more. With many vegetables or edible plants, early crops are of the highest consequence, and early produce is almost always combined with rapid growth to perfect itself in a short time, or hardness, so that one of these qualities seems almost consequent upon that of earliness. An early cabbage must be hardy even while growing or the frosts would destroy it. Early produce in peas and beans is as important as flavour, and for market it is more important than flavour, so also it is with potatoes, and scores of other edible productions, but in all those there are other qualities not to be lost sight of. The produce should be handsome. If it be asked how is it that vegetables have been improved so much without the publication of any rules for estimating the properties? the answer is, the price a thing brings at market does it all. Is it before others? it stands alone and brings a high price. Is it handsomer than others? it brings its price. Is it a better flavor? as soon as cooks find it out, it brings a better price, there is no difficulty in finding the value of what is to be eaten, the only difficulty is in pointing out those properties of a subject which depend on fancy, and he who is wise enough to know what will in the end please most, and firm enough to insist upon it while prejudice is against him, does much for floral science and all engaged in it. We have done our part, and have been happy enough to establish a taste which universally prevails.

#### RIBES SANGUINEUM.

ALMOST every person of taste either possesses, or is perfectly acquainted with that beautiful shrub, *Ribes Sanguineum*—the crimson or pink flowering currant. It was introduced in 1826, when Mr. Douglas forwarded seeds to the Horticultural Society's garden. He says, "It usually grows on rocky situations, or on shingly shores of streams, in partially shaded situations." It is a native of North-west America, and according to Mr. Douglas, "Archibald Menzies, Esq., discovered it near Nootka Sound in 1787, when on his first voyage

round the world; and in 1792, on his second voyage with the celebrated Vancouver, he found it again in various parts of North-west America. The spirit of ardent research was not, we must conclude, in any great activity at the periods alluded to, or otherwise how are we to account for the absence of such a gem from our collections during 49 years from its first discovery.

Paxton said, in 1834, "it is perfectly hardy;" and so it proved to be. I had one fine plant, which made a profusion of choice wood in 1837; it was pruned by a youth in spurring order, very erroneously, I think; but the object was to obtain a number of small cuttings, all of which were put into a bed protected by a screen of laurels at north-east. In December, every one of those perished by the acute frost of January, but the mother-plant retained its buds without injury. Its subsequent bloom, however, was neither so ample nor richly tinted as that of 1837. This shrub must be treated as *Ribes nigrum* (the common black currant), not spurred or shortened, but cleared only of superfluous wood by close pruning. The generic character of *Ribes* states the "berry to be round, umbilicated, of one place, many seeded." But the seeds of this *ribes* are not round, they are of a perfect egg-shape (oval), the blunter end being the apex, which is crowned by the persistent, withered calyx. Nothing can exceed the beauty of this little fruit: it is nearly half an inch long, and one-third of an inch wide in the middle; its colour is that of a pale French gray, just *that* which would be produced by a coating of dead white paint applied over a mulberry tinted smooth surface. The berry is dotted with many hairy appendages, which are not simple; but, when examined by the microscope, are seen to be terminated by a flattened round head. The colour of these hairs, or bristles, being black, with the proportion in which they exist, give a half-mourning appearance to the fruit that is quite peculiar. Separated from the footstalk, each full swelled perfect berry exactly resembles the beautiful egg of a very small bird—that of the tom-tit or blue titmouse (*Parus caruleus*) is not widely dissimilar. Each berry contains somewhere about eight seeds, shaped like tamarind stones, invested with pulp: they are of a dark green, and about as large as a brocoli seed. The pulp in which they are embedded has little flavour; it is viscid and purely mucilaginous, deeply suffused with purple.

It was stated by Mr. Douglas, that, in the limestone districts, the flowers are of a deeper colour, whence it was thought that a portion of lime rubbish added to the soil might improve the crimson tint. Others have said that

pure loam, with the total absence of manure, would be beneficial. It proves, however, to be in nowise dainty about its soil; wherever the other ribes or currants will grow, sanguineum does equally well. The varieties obtained from seed, vary in shade from almost white (*Ribes Album*) to the deepest red; and probably we may yet get other colours by impregnating it with the yellow species. *Ribes Sanguineum*, and its varieties, are now almost as common and as beautiful as any deciduous plants which we possess.

#### ON THE MANAGEMENT OF IMPORTED SEEDS.

As considerable difference of opinion exists respecting the best mode of the treatment of such seeds, I may mention that I consider the preferable mode is to sow them as soon as possible after their arrival, and in general, at whatever season of the year. Seed preserve their vitality, or power of growth, much according to their size; thus the smaller seeds are less able to bear the inconveniences of a long passage by sea, and the varieties of temperature to which they are exposed. The larger seeds preserve their vitality longer, and therefore it may occasionally be recommended that they should not be sown until the spring, which is the natural season when they may be expected to grow.

Upon the arrival of a box of seeds, my mode of proceeding is this;—supposing them to arrive in the beginning or middle of summer, the different sorts should be sown in the soil best suited to the plants to be grown, although, perhaps, a light loam, with a mixture of leaf mould, will answer for most of them, while in seed pan; the seed should then be sown of the proper depth, which will in most instances be regulated by the size of the seeds, the larger nuts being sown one or two inches deep, while the smaller ones should be sown on the top of the mould, and then a mere sprinkling of mould be added, and afterwards a small sprinkling of white sand be put on the top. The object of this addition is to prevent the plants, on their first appearance, damping off; which all tender plants, but especially herbaceous ones, are apt to do. If the season be far advanced, for instance the autumn, there is little inducement for pushing forward the germination or growth of the seeds, and the pans may be placed on the stage of the greenhouse for the winter. My great object in sowing them at what may be considered an unfavourable season, is more with a view to prevent the loss of vitality, by keeping them in an intermediate state of dampness and dryness, than by keeping them in their packages all the winter.

If, however, it be either in spring or the earlier part of summer, or indeed not very late in the season, I put the seed pans in a hotbed or other place where they may get bottom heat; and I conceive that an error takes place in this respect, by supposing that much bottom heat will injure the heads. This I do not think is the case; many seeds require a very considerable bottom heat to make them germinate, especially if they are weakly, and perhaps imperfectly ripened; the chief danger will be after the plants begin to make their appearance. While in this state, too much heat will of course destroy the plants; they must be kept tolerably damp, if in heat; and the heat, if very great, must be moderated by raising the glasses and shading the plants, which will be treated much in the way that our common flower seeds are treated; that is, they must be gradually hardened, and shifted into separate pots, the size of which will be regulated by the kind and size of the future plant, and which cannot be entered into minutely; the soil in the new pots may be made more to resemble that which they will probably require when they are larger plants. In general with herbaceous plants, which are more likely to damp off, a little white or common sand will be placed at top to absorb the superfluous moisture, and the pots should be placed in a drier situation than is necessary with woody plants. The plants may very soon be placed in the temperature best suited for them, according to their native climate, either in the stove, the conservatory, or greenhouse, or the open air; observing, in general, that any change of temperature must not be made too suddenly; but, as the gardeners say, the plants must be hardened or prepared for it. When the plant is intended for the stove, or conservatory, or greenhouse, but little preparations will be found necessary; but when it is to go to the open border, it can be prepared by being removed to a cool frame, as it is called; that is, a frame where there is no artificial heat produced by dung or fire, and the glasses will be removed or raised in favourable weather. In summer, the pots may be very soon placed out, rather in a shady place, and in the course of every ten days they may be fully exposed; observing, however, that they must be watered occasionally in the evenings when the weather is dry.

It may be proper to caution those who have not much practice in the matter, that many seeds, but chiefly the larger ones, will lie in the ground for two years before the plants make their appearance, and sometimes a few will spring while the others lie dormant, it is obvious that on such occasions the plants, if any have come up, should be taken out and put in sepa-

rate pots, while the pan itself will be allowed to remain ; it may, during the summer be put out in the open air, but on the approach of winter must be placed under cover either in a cold frame, or in the greenhouse, where it may stand on one of the back shelves, and in the following spring it must again be put in a situation where it may get bottom heat, and if any plants then make their appearance they must be taken care of in the usual manner.—*Jas. Heriot.*

#### ON THE CULTIVATION OF ASPARAGUS.

ABRIDGED FROM THE TREATISE BY MR. NIVEN.

THE *Asparagus officinalis*, of Linnaeus, is a native of our shores, but by no means very common, as an indigenous plant ; so insignificant is it, when compared with our well-cultivated specimens, that, unless by a botanist, it might be passed over unobserved, undetected as such. When found, it is usually in sandy districts, near the sea-shore ; as in the isle of Portland, near Bristol ; and in Scotland, on Seaton Links, near Edinburgh ; but not as yet found native in Ireland. On the inland sandy plains of different parts of Europe, it is said considerably to abound, as in Russia, Turkey, and Greece, where it is eaten by the cattle and horses, as grass. Of this vegetable there is only the species above named in cultivation in British ardens, and, we think, but two varieties, namely, green and red-topped ; the latter variety being generally considered the best. All others may properly be considered as sub-varieties of the above two. Medicinally, asparagus is considered diuretic, as well as nutritive and light of digestion. It is, from the former excellent quality, much in request among the sedentary operative classes in France, who are said to be frequently more or less affected with symptoms of gravel or stone. In consequence of its nutritious and light quality, it is not less in request for delicate constitutions and convalescent patients.

*Directions for Cultivation.*—Any time during the winter or spring, choose any portion of the surface of your garden with an open, south exposure ; it matters not much what the soil may be on which the plantation is to be placed, so being, that the surface-water in winter does not stagnate on or about it—but a soil of sandy quality is always to be preferred, where it can be obtained ; but where not it is easy to add a few loads of sand in the surface preparation. Having fixed upon the space to be occupied, a layer of half-rotted leaves, or rotten hot-bed dung, may be spread over the whole, about three inches thick, to which might be added, where it could be obtained, a stratum of sea-weed. This, during

the winter, should be slightly dug into the surface, leaving the whole in narrow ridges, the better to receive the action of the weather. Or it may be done immediately before planting in spring. This process of surface management we propose describing under the following heads, namely ;—1st, Planting ;—2nd, Summer treatment ;—3rd, Winter ditto ; 4th, Forcing.

*1st. Planting.*—About the end of March, or beginning of April, choose a dry day, and have the ridged-up surface neatly levelled down ; after which, slightly dig the ground over again, which will thoroughly mix the surface with the manure and sand first applied ; then tread over the whole, regularly, with the feet, and proceed to mark off with the measuring-rod the places for the intended lines, at four feet apart ; studying to run them as nearly north and south as possible, marking the place of each line with the corner of a draw-hoe, as for peas. This being done all over the plot, at the distances described, have a quantity of compost ready, as one-third rotten leaves, or rotten dung, one-third fresh soil ; a hazel-coloured sandy loam, from the corner of any grass-field, is best, and one-third rabbit or sea-sand. If this has been for some time previously prepared, so much the better. Along each drill or line lay a small ridge of the said materials. Choose, if possible, good strong two-year-old plants : as it is of essential importance that the roots should be as little exposed as possible, during planting, to a drying atmosphere, it may be best to proceed thus :—carefully lift the plants, and cover them over in the barrow or basket with a little sand ; proceed to set them on the little ridge or saddle prepared for them, as a man sits upon horseback, at about six inches apart from each other, having a person to follow with a barrowful of sand, which with the spade he lays over the roots and crowns, about one inch thick, observing to tread, successively, both sides of each line, as he proceeds with one foot to firm the sand to the plants, so as to secure them from the action of the air, until the process of planting is concluded, when a second and final covering of four inches of the compost is to be put over the ridges or lines, which is to be firmly trod to the line of plants as before. A small portion of the original surface between may then be thrown up with the spade, right and left, dressing neatly between every two lines, as you proceed, and the process of planting, which is exceedingly simple, is finished. A plantation so made, containing from about 140 to about 200 square yards, and requiring from 700 to 1000 plants, or so, would be sufficient to supply Asparagus, during the season, for any or

dinary family—the expense of which, apart from the plants (which might be about two shillings and sixpence per hundred,) would be a mere trifle, particularly where sand and leaves, or rotten dung, are easily to be had.

2nd. *Summer Treatment*.—This is an important part of our practice. The plantation being finished, as above described, a good watering or two, should the weather be very dry, would, towards May, be advisable. In May, when the short-grass mowing begins, a portion of it is to be brought to the Asparagus lines, and shaken in between, quite to the necks of the plants—say, so as to fill up the hollow spaces between nearly level. The object of this application, which must be renewed about once every month during the summer, will at once appear evident—namely, the retention of moisture, and the production of vegetable food, which, along with the slight fermentation that accompanies the decomposition, greatly accelerates the growth of plant; beside the formation, ultimately, of a bed of the purest vegetable matter, into which, on both sides, the succulent roots of the Asparagus plants run freely. In this way, from the proximity of the roots to the surface, the genial influences of solar heat, and due atmospheric action, are enjoyed by the plant, without the least danger of its ever suffering from drought, in consequence of the non-evaporating nature of the vegetable *mulching*,\* or covering alluded to, which receives and retains, as a sponge, the greater portion of the moisture that falls upon it; whereas, in the common Asparagus bed, the surface, during the dry part of the year, is almost completely exposed to the action of the sun, which, during the continuance of dry weather, may be seen to crack or rend in every direction to the destruction of the roots, in very many instances. After the shoots have begun to come up, we begin to look regularly and carefully after the thinning. When the plants have pushed two or more heads each, the weakest are regularly cast away as the stronger heads appear; so that, by the end of the first season, not more than two, or at most, three shoots, are left to grow to maturity on each plant. Proper attention to the thinning of Asparagus, in the first instance, immediately after planting, during the first and second years, and afterwards also, in cutting for use, is of essential importance towards the future welfare of the plant.

3rd. *Winter Treatment*.—In November, or, as soon as the tops of the Asparagus become

yellow, the whole are to be cut over, and the soil along the crown of the ridge or line cleared away a little with the hand; when about four inches of sea or rabbit sand is to be laid along over the line of plants—this chiefly for the purpose of providing against the depredation of slugs in spring, and the clean free progress of the heads the season following. In the spaces between the lines, a few barrow-loads of rotten dung, leaves, or sea-weed may be laid, and the whole is to be neatly levelled with a three pronged fork, stirring up the surface between the lines very slightly, as the level of the fresh material proceed. No further care is required till spring, when, just as the first heads begin to appear, the whole may be slightly stirred on the surface, and over the lines a little of the sand raked off. The process of *mulching* with short grass, or, instead of it, other vegetable or decomposing animal matter, is to be followed up, as already described, from year to year. The second year, some of the thinnings may be fit for use, but, by no means, should any of the strong heads be cut for that purpose, except where there are too many to one plant, as the patience and forbearance now exercised will be amply repaid by the produce next year, when the crop may be regularly cut for use. In gathering Asparagus, a habit prevails among many gardeners of cutting the heads a few inches below the surface, but for what useful purpose we are at a loss to conceive, inasmuch as the white or blanched part of the grass is usually so hard and stringy as to be scarcely fit for use; whereas, by allowing the heads to grow the proper length above the surface, say about eight inches, or so, they will not only be compact, but the whole of the grass tender and eatable.

4th. *Forcing Asparagus*.—Wherever the forcing of Asparagus is an object, a supply may cheaply and readily be obtained for the table, for at least six months of the year. With the view of making a fresh plantation, every third or fourth year, according to the quantity required, a small stock of seedling plants should be kept ready for use when needed. In the seed-bed, we prefer sowing rather thinly, on a light well-prepared bed of fine earth, which will yield plants fit for transplanting the first year after sowing; but, after two years, we would prefer them. A plantation, such as we have described, being formed every fourth year, a portion of the preceding one may be lifted, for forcing, every year, after the second comes into bearing; and so keep on with a regular rotation of sowing, planting, and forcing, upon a comparatively small surface of ground, which will be much improved by the alternate cropping and mov-

\* *Mulching* is a term applied by horticulturists to any vegetable substance that may be applied as a surface covering over soil. In France, it is much more practised than in these countries.

ing. Various methods are in practice for bringing this desirable vegetable into use for the table early. Perhaps no more simple or successful one is followed, than that of placing the roots in the border of any early vinery, or peach-house at work; where, by being closely placed together, the spaces between the roots filled up with fine mould, and covered over about two inches above the crowns, the produce will be rapid and regular, in proportion as the house may be more slowly or quickly forced. A succession may be kept up in this way, where there may be several such forcing-houses; as it is only in the early stage of the forcing of such houses, that Asparagus will succeed best when grown in them. In a similar way, a good succession of Asparagus may be kept up, from an exhausted tan-pit, where pines have been grown the preceding season. Next to the above method, where

houses do not exist, or where it may not be convenient so to occupy them, old melon-frames answer equally well, to be worked by fresh linings of fermented dung, the old bed being well perforated below, to admit the heat more regularly through it, from the linings! Two or three light frames worked alternately in this way, observing to fill one, as the other is fit for cutting, will afford a regular supply for any middling sized family, about every second or third day. Asparagus will also do well on newly made up beds; but great care must be taken to have the materials well fermented, and the bed properly sweetened, previous to planting, else the roots may be seriously injured if not quite destroyed, as no plant is more impatient of overheat than Asparagus; on this account, we would prefer forcing this vegetable in exhausted beds, or pits, as the case might be.

## Encyclopædia of Flowers.

### A TREATISE ON THE CULTURE OF THE CYCLAMEN.

THIS is a very beautiful tribe of plants, of an neat and compact appearance, flowering abundantly above the foliage, which is for the most part bright and pretty, and close down upon the root. The flowers of all rising direct from the top of the bulb in single stalks, without foliage. The varieties in the present day are numerous, and increasing every season, some being produced, others introduced. The culture is very simple; that recommended by Miller has been successful with us, excepting that, instead of keeping seedlings in their beds or boxes till they bloom, we have found their blooms greatly hastened by shifting them as soon as they are two years old into pots of a small size, giving each its own pot. Linnæus decided that all Cyclamens were varieties of one species, and there is but one fact which tells against it being so, that is, some are hardy and some not so. Miller gives an account of the following six:—

1. *C. Europæum*; Sowbread, with an ivy-leaf.

2. *C. Purpurascens*; round-leaved sowbread, with a purple under side.

3. *C. Persicum*; Cyclamen with sawed, heart-shaped leaves, or Persian Cyclamen.

4. *C. Vernale*; Cyclamen with heart-shaped angular leaves, which are entire.

5. *C. Orbiculatum*; Cyclamen with an unequal root and round leaves.

6. *C. Coum*; Sowbread with orbicular plain leaves, shorter foot-stalks, and smaller flowers.

The first sort, *C. Europæum*, is the most common in the English gardens. This grows

naturally in Austria, Italy, and other parts of Europe, so will thrive in the open air in England, and is never killed by the frost. It hath a large, orbicular, compressed root, from which arise a great number of angular heart-shaped leaves, upon single foot-stalks, which are six or seven inches long; these leaves are marked with black in the middle; the flowers appear before the leaves, rising immediately from the root, with long fleshy foot-stalks; they appear in August and September, and soon after the leaves come out, continue growing all the winter and spring till May, when they begin to decay, and in June they are entirely dried up. The seeds ripen in June, and should be sown in August. There are two varieties of this, one with a white, and the other with a purplish flower, which appear at the same time.

The second sort, *C. Purpurascens*, flowers in autumn; this is at present very rare in England; the leaves of this sort are large, orbicular, and heart-shaped at their base, and of a purple colour on their under side; the leaves and flowers of this come up from the root at the same time; the flowers are of a purplish colour, and their bottoms are of a deep red. It flowers late in the autumn, and requires protection from the frost in winter.

The third sort, *C. Persecum*, has stiff heart-shaped leaves, which are sawed on their edges; these have strong fleshy foot-stalks near six inches long, of a purple colour, as are also the veins of the leaves on their under side, but the upper side is veined and marbled with white.

The flowers rise with single foot-stalks from the root; these are pure white, with a bright purple bottom; the petal is divided into nine segments to the bottom, which are twisted and reflexed backward like the other sorts. This flowers in March and April, and the seeds ripen in August.

The fourth sort, *C. Vernale*, is commonly called the Persian Cyclamen. This has large angular, heart-shaped leaves, whose edges are entire; they are veined and marbled with white on the upper side, and stand upon pretty long foot-stalks; the flowers are large, of a pale purple colour, with a bright red or purple bottom. These appear in March and April, and the seeds ripen in August.

The fifth sort, *C. Orbiculatem*, has a small irregular root, not larger than a nutmeg; the leaves are orbicular and small; the flowers are of a flesh colour, small, and have purple bottoms. They appear in the autumn, but rarely produce seeds in England.

The sixth sort, *C. Coum*, is not so tender as the four last-mentioned, so may be planted in warm borders, where, if they are covered in hard frost, they will thrive and flower very well. This has plain orbicular leaves, which have shorter and weaker foot-stalks than either of the others; their under sides are very red in the beginning of winter, but that colour goes off in the spring; their upper sides are smooth, of a lucid green, and spread open flat; whereas the other sorts are hollowed, and reflexed at their base. The flowers are of a very bright purple colour, and appear in the middle of winter, at a time when there are few other flowers, which renders the plants more valuable. The seeds of this sort ripen in the end of June.

There are several other varieties of this plant, which chiefly differ in the colour of their flowers, particularly among the Persian kind, of which there is one with an entire white flower, which smells very sweet; another, which we first observed at Guyat's nursery at Hammersmith, of a rosy colour, and extremely fragrant, in all other respects like the Persicum, and very showy; but as they are seedling varieties, they are not enumerated here, those which are here mentioned being, according to Miller, distinct species; for he had many years propagated them from seeds, and he had not found them vary, nor had he heard that any other person had observed either of them alter, farther than varying of their colours.

All the sorts are propagated by seeds, which should be sown soon after they are ripe, in boxes or pots, filled with light kitchen garden earth, mixed with a little sand, and covered about half an inch deep, placing them where

they may have only the morning sun till the beginning of September, when they may be removed to a warmer exposure. Those of the first sort may be plunged into the ground close to a south wall, a pale, or reed hedge, in October, where, if it should be very severe frost, it will be proper to cover them either with mats or peas haulm, but in common winters they will not require any covering. The pots or tubs in which the Persian kinds are sown, should be placed under a common hot-bed frame, where they may be protected from frost and hard rains, but in mild weather the glasses may be taken off every day to admit fresh air to them. The first sort will come up about Christmas, if the seeds were sown in August, and their leaves will continue green till May; and those of the Persian kinds will come up early in the spring, and continue green till June, when they will begin to decay; then they should be removed to an eastern aspect, where they will have only the morning sun, in which situation they may remain till the middle of August; during which time they should have very little water, for then the roots are in an inactive state, when much wet will rot them. The pots and tubs in which they are sown, must be constantly kept clean from weeds; for if the weeds are permitted to grow, their roots will closely entangle with those of the Cyclamen; so that in pulling out the weeds, the other roots will be drawn out with them. In the beginning of October, there should be some fresh earth spread over the tubs or pots, which should be removed again into shelter, in the same manner as before; and the following summer they must be managed also in the same way, till their leaves decay, when they should be carefully taken up, and those of the first sort placed in a warm border, at three or four inches distance, but the other sorts must be planted in pots to be sheltered in winter.

The third, fourth, and fifth sorts, are more impatient of cold and wet than the other three; these must constantly be preserved in pots, filled with sandy light earth, and housed in winter, but should be placed near the glasses, where they may enjoy as much free open air as possible when the weather will permit; for if they are crowded under other plants, and are kept too close, they are very subject to mould and rot; nor should they have much water in winter, which is also very injurious to them, but whenever they want water, it should be given them sparingly. In summer these plants may be exposed to the open air, when their green leaves will decay; at which time you should remove them to a place, where they may have the morning sun until eleven o'clock; but during the time that the roots are

destitute of leaves, they should have very little water given them, because at that season they are not capable of discharging the moisture. This is also the proper season to transplant the roots, or to fresh earth them; and as the autumn comes on, that the heat decreases, they may be removed to places more exposed to the sun, where they may remain until October before they need be housed.

Toward Christmas, if the roots are in good health, the sixth sort will begin to flower, and continue producing fresh flowers till the middle of February, and will be succeeded by the Persian sorts, which continue till May; but if you intend to have any seeds, you must let the pots be placed so as to receive a great share of fresh air, for if their flowers are drawn up in the house, they seldom produce any seeds. These seeds are ripe about July, when they should be immediately sown in pots or cases of good light undunged earth, which should be sheltered in winter under a frame, and exposed in summer in the same manner as is directed for the older roots, observing to remove them into pots at a wider distance when they are two years old; and so from time to time, as their roots increase in bulk, you must give them more room; and in about four years time they will begin to flower; but this may be hastened by giving each bulb a pot to itself at the end of the second year, and shifting them as they fill the pot with fibres.

A successful cultivator, who gave an account of his practice some time since, in a publication which has been discontinued, gives a further account of some varieties not mentioned by Miller, but well known now. He tells us that the *Cyclamen hederifolium* is indigenous. The *europium* is from Austria, and was in cultivation in this country in 1596; the *coum* and *vernum* are from the south of Europe, and were introduced in 1731, in the southern counties; these species are hardy, and flower in the open air freely.

The *C. persicum* is from the island of Cyprus, requiring a warm greenhouse temperature to be grown to perfection; of this species there are two varieties, the one scentless, the other highly odoriferous. These are, I consider, in early spring, the greatest ornaments that Flora affords, without forcing is resorted to; but, although they have been introduced upwards of one hundred years, comparatively few persons grow them, and fewer still to that perfection they are capable of attaining. I have always had larger flowers upon the scentless than upon the fragrant sort; but I prefer, and would recommend the latter, the colours being just alike in either.

The *repandum* deserves especial notice, both

from its variety and comparatively recent introduction, and great beauty; its flowers are of a rosy red colour, produced plentifully, and continue in bloom a long time; it usually flowers in May.

The *C. europium* and other hardy sorts seed freely, and if kept in pots undisturbed every year, will produce young plants in abundance without trouble; which, on the leaves dying off the second year, should be transplanted into a rich and light soil, and set in a shady place, protected from rain for a month, after which they should be occasionally watered, and housed through the following winter. The tubers will be about the size of marbles in three years, from seed; and may be expected to flower on the fourth or fifth season. I consider them in their prime from the seventh to the tenth years of their growth.

The *C. persicum* and *repandum* are shy seeders in general; the former takes twelve months to ripen it. On its becoming black, it should be sown, say six or eight in a five-inch pan, in light and pretty good soil; and, if a little bottom heat is given, will quickly vegetate. On the dying away of the leaves, they should be kept dry until August, when they should be occasionally watered and carefully protected from cold during the winter. After the first year, they should be annually potted, and treated as old plants—if successfully grown, they may be expected to flower the fourth year. The *repandum* has never seeded with me; but from the growth of some purchased plants, I conjecture that six years is not more than the usual growth to a flowering state.

The whole of the species and varieties require one general treatment as to soil and water. After the flowering season of the spring flowering sorts, and the decay of the leaves of the autumnal ones, the water should be discontinued gradually; and on the decay of the leaves, the pots had better be placed in a shady place, on their sides, to prevent any water falling on them, as, like bulbous plants, they require a season of rest. The whole of the soil may be shaken from their roots early in August, and planted in a rich loam soil, in which is a good portion of well decomposed dung, and a little fine sand. They should be then put into the garden, and plunged until September, putting a little soot in the bottom and about the holes they are put in, to keep out intruders; they will require plenty of air and little water in November and December. In January, they should be watered freely, be top dressed with rich soil, freely supplied with water, and kept close to the glass in a warm situation, airy rather than otherwise; they will be in flower in February and March generally.

The pot should be twice the diameter of the tubers.

The varieties mentioned by Paxton are Coum, Europeum, Hederifolium, Albidum, Purpurecens, Ibericum, Latifolium, Linearifolium, Neapolitanum, Persicum, Albiflorum, Modorum, Odoratum, Lacineatum repandum verum, Lilaceum, and Punctatum. It is almost needless to say that many of these distinctions are very trifling. The principal sorts we recommend to cultivators, are Persicum, Europeum, Repandum, and Coum; and to propagate from seeds and take care of offsets when they appear; though there is no dependence on them, as we have known a plant to grow for years without producing one. A very silly practice has been adopted occasionally for the purpose of propagating; that of cutting up the root into pieces; they never make such good plants if they live, and most live only long enough to sell. The sorts are not difficult to seed, if they have air while in bloom. With regard to the soil, we have never been particular; but when we had to make it on purpose, we used half loam from the top spit of a meadow well rotted, and the other half leaf mould and dung rotted to mould; if the loam happens not to be sandy, some sand must be added.

#### NATURAL HISTORY.

**LANGUAGE OF ANTS.**—The different modes in which ants, when they happen to meet during their excursions, mutually touch each other with their antennæ, appears to constitute a kind of natural language understood by the whole tribe. This contact of the antennæ evidently admits of a great variety of modifications, and seems capable of supplying all the kinds of information which these insects have occasion to impart. It would seem impossible, indeed, for all the individuals comprising these extensive societies to co-operate effectually in the execution of many works, calculated for the general benefit of the community, unless some such means of communication existed. There is no evidence that sound is the medium of this intercourse; for none, audible to us at least, was ever known to be emitted by these insects. Their mode of conversing together appears to be simply by touching one another in different ways with the antennæ. Huber's observations on this subject are exceedingly curious. (See his "*Recherches sur les mœurs des fourmis indigènes*.") He remarks that the signal denoting the apprehension of danger, is made by the ant striking its head against the corslet of every ant which it chances to meet. Each ant, on receiving this intimation, immediately sets about repeating

the same signal to the next ant that comes in its way; and the alarm is thus disseminated with astonishing rapidity throughout the whole society. Sentinels are at all times stationed at the outsides of the nests, for the purpose of apprising the inhabitants of any danger that may be at hand. On the attack of an enemy, these guardians quickly enter the nest, and spread the intelligence on every side; the whole swarm is soon in motion, and while the greater number of ants rush forward with desperate fury to repel the attack, others who are entrusted with the office of guarding the eggs and the larvæ, hasten to remove their charge to a place of safety. Latreille relates, that having deprived some labouring ants of their antennæ, he replaced them near the nest; but they wandered in all directions as if bewildered, and unconscious of what they were doing. Some of their companions were seen to notice their distress, and, approaching them with apparent compassion, applied their tongues to the wounds of the sufferers, and anointed them with their saliva. This trait of sensibility was repeatedly witnessed by Latreille, while watching their movements through a magnifying glass.—*P. M. Roget, M.D.*

#### NATIVE EARTHS.

"Clay or alumina—so called because it is obtained in its purest state from alum, in which it is combined with sulphuric acid, is the basis of all strong or heavy soils. When it is minutely divided, it is easily suspended in water. When dried slowly, and stirred while drying, it becomes a fine powder, soft to the feel, and kneaded with water, a tough ductile mass, easily moulded into hollow vessels which retain liquids. This property of being impervious to water, gives the specific character to clay as an ingredient of the soil."

The agriculturist must always remember that there is a wide difference between *clay* or *clays*, and the *matter of pure clay* (alumen). It is extremely difficult to find a specimen of the latter, unless it be obtained by chemical agency from alum, as above stated; but an approach to pure clay is attainable in the form of that peculiar substance which is used in the manufacture of tobacco-pipes, and thence called pipe-clay. If this substance be boiled for some hours in oil of vitrol, a large quantity of it will be dissolved, leaving another portion that is insoluble. The former is the *alumen* or clay; the latter consists chiefly of fine flinty matter, or siliceous earth. The purest and strongest clays of the field contain a very great proportion of sand, more or less coarse; a quantity of iron, generally in the state of yellow, ochrous oxide, and not unfrequently a portion of chalk.



All these constituents will become the subject of investigation ; but for the present the sole object of interest is the clay or aluminous ingredient of the soil. The *test* by which its presence and quantity can be most readily detected, is the *sulphuric acid*, called oil of vitrol, as when assisted by a boiling heat it dissolves the clay, and removes it from the other insoluble matters with which it existed previously, in intimate union. I will explain the action of the acid in order of *analysis*, but to this we have not yet approached. In following the course adopted by the writer from which I quote, some allusion will always be made to the chemical agent that is brought to bear upon it as a test. In this way the reader will be in a degree, prepared to understand the meaning of those terms which must be introduced, and the chemical affinities which certain substances bear to others. Thus, in the present case : clay, that most important article in all good soils, is discovered and separated by *oil of vitrol*. That fluid, therefore, is a test or *re-agent* of *pure clay*, and this fact being appreciated, we have gained a point—have taken a great step in the road of science.

"*Silica*, or the earth of flints suffers no change in water. It consists of crystals or fragments of very hard stone, forming *gravel* or *sand* according to their size."—"Siliceous sand holds water in its interstices by simple cohesive attraction in proportion to its fineness. It heats and cools rapidly, letting the water pass through it readily either by filtration or evaporation. Its use in the soil is to keep it open, to let the air and water, as well as those other substances on which the growth of plants depend, circulate through it. Unmixed, it dries so rapidly that no vegetation can continue in it, unless a constant supply of moisture be given by irrigation. A small portion of clay will much improve light sands ; it takes a large quantity of sand to correct the tenacity of clay."

The latter remark is strictly true ; but it must be admitted that the cohesiveness of hard binding soils does not depend exclusively upon the clayey material with which the sand is combined. I have tested earth which, if moved when in a wet state, becomes as hard as a brick, yet has afforded scarcely fifteen parts in a hundred of alumine. The clinging quality results from the peculiar constitution of the sandy matters : if these consist of harsh gravelly grit, with a certain but smaller proportion of very fine sand, coloured with iron, the loam will be harsh and intractable when wet, though moderately free when moistened by gentle rain after drought. Sand, added to such a soil, will prove a very inadequate meliorator ; but a liberal quantity of coal ashes, which contain fine silix, some clay, and highly oxygenated iron, has proved extremely effi-

cacious. The rich and unctuous loams that constitute the best wheat soils, and indeed the finest medium for almost all the crops of the field and the garden, contain a far greater proportion of clay ; their free texture being secured by the extreme fineness of the siliceous sand with which the clay is intermixed.

*Silix* or *flint*, in its purest form, is seen in that beautiful production of nature — *rock crystal*. Its base may be suspected to be metallic. It is one of the most important substances of the mineral creation, and performs offices of far greater magnitude than those ascribed to it by the writer of the previous paragraph : it is a powerful electric, and has, by that eminent chemist, Mr. Hume, been conjectured to be *oxygen* itself in the solid form. The silix of the soil is insoluble by any of the acids usually employed.

"*Lime* in its pure state is familiar to every one as the basis of the mortar used in building. It is produced by burning marble, chalk, limestone, or shells, in a great heat. In the stones which are formed principally of lime, it is combined with some acid, generally the carbonic acid, which separates from it by the operation of burning in the form of an air or gas, hence called *fixed air*, from its being thus fixed in a stone. These stones, of various degrees of hardness, are now all classed under the name of Carbonates of lime. Carbonate of lime," (best known by the term *Chalk*) "as an earth is neither so tenacious as clay, nor so loose as sand." "Its distinguishing feature is its solubility in acids, which it neutralizes, depriving them of their noxious qualities in the soil. A proper mixture of these three earths in a due state of mechanical division, forms a soil well fitted to the growth of every species of plants, especially those cultivated for food ; and nothing more is required than a proper climate as to heat, a proper degree of moisture, and sufficient nourishment, to make all the plants generally cultivated, thrive most luxuriantly in such a mixture, which is usually called a loam."

The foregoing passage is most comprehensive, and little need be remarked upon it, or further said on its chief facts till we refer to calcareous manures. Lime, as it exists in soil, is the substance which is usually first sought for in the processes of analysis, as it is the one most easily dissolved ; its appropriate solvent is the *mariac acid*, and its presence when dissolved by that acid, is readily detected by a re-agent called oxalic acid, by which it is precipitated in the form of an insoluble white powder. Our next article will comprise facts of still increasing importance, as connected with the fertilizing qualities of the soil.

PUBLIUS.



#### DESIGNS FOR FOUNTAINS.

THE design now presented is adapted for any place where the supply of water is small, and can be sent through an aperture of such dimensions as can be made available. It is, in fact, adapted for the overflow of a bath, or of a constant spring; and, although it would do just as well through a lion's head or a dolphin's mouth, this is one of the contrivances

of an artist as capable of designing one thing as another, but who seems to prefer doing something that nobody else has done; it is adapted for the opposite side of a piece of water of any size, and should be so placed as that the back could not be seen; therefore, placed against a thicket at one edge of a stream it would look bold and picturesque.

### Flowering Shrubs, No. I.

#### THE AZALIA.

THE Hardy or American Azalia is among the most effective of the deciduous flowering shrubs and plants which now ornament our best plantations and pleasure grounds, and the varieties are endless. The florists of Ghent made a very decided advance in raising seedlings, and their novelties have been long since known and cultivated here under the name of the Ghent Collection. Many of the varieties from America were little better than weeds, the flowers being small, ragged, and altogether insignificant; others altogether as beautiful; and the Ghent florists have succeeded in producing fine combinations of colour, besides obtaining the distinct colours of small varieties on plants producing large blooms. All idea of dividing these plants into species seems useless; the hardy deciduous kinds are one large family, seeding freely, and producing many varieties of character, habit, colour, and season

of bloom from the same bunch of pods, or for aught we know, from the same pod. Hence the collection of Azalias would be very extensive, and many of them a good deal similar to each other. While the Ghent people were advancing in the culture of this plant, and the production of new varieties, which they soon distributed at high prices in collections, Mr. Waterer, of Knapp Hill, was going on quite as rapidly, but more quietly, in England; and the most extraordinary part of the business was, that he failed to take the trouble of classifying and selling; though, while the Ghent varieties were being purchased by nurserymen and propagated for sale, Mr. Waterer's (in many instances) superior varieties were crowding each other in the seed beds at Knapp Hill, unnoticed and almost unknown. Indeed, to this day, but few out of an enormous quantity have been yet selected; and until

the Messrs. Waterer established the Annual American Garden in the King's Road, few people had the least idea of the numerous and splendid novelties that could be abstracted from the seed beds at the nursery without being even missed. We have been frequently solicited to publish in detail our notices of what an Azalia should be to become perfect, that those who take the trouble to raise seedlings might know what to select and which to throw away. We have already given the properties of the Rhododendron, which we look upon as part of the same family; we require round flowers, less confusion, and the bloom abundant; the joints of the branches short, the leaves large, and the bunches of bloom large in proportion. With regard to the choice of a collection from the present varieties, we should simply make it a condition with the nurseryman, that we would only have the large flowering kinds, whether American, or Ghent, or English kinds. The petals of many sorts are narrow and pointed, the exact counterpart of what they should be to look handsome. They ought to be broad and blunt, and there are plenty of very fine varieties approaching it; so that those who are about to plant, if it be only a dozen plants or hundreds, have no occasion to plant a bad one, though they will still be greatly improved. These plants thrive best in that peaty kind of earth which may be dug up in lumps, and be held together by the half-decayed vegetation of which it is full. In making up a bed for American plants, two-thirds of this kind of earth, and one-third of leaf mould, will be found admirably calculated to grow them in perfection; and where this peat mould abounds, and as at Wimbledon, Bagshot, and many other places, the only dressing it requires is the leaf mould, or in its absence, dung rotted into mould. The plants are raised from seed, propagated by layers, cuttings, and grafts; but the prevailing, because the most certain method of propagating a variety, is by layers. The branches are cut at a joint, and split up a short distance, and the part pegged down under the surface all round the plant; these laid down one autumn may be cut off the next; and in many cases, we believe it would, if only bent down and pegged at a joint. Indeed, if a plant be low down in the earth, it will often root at the bottom of every branch, which only require to be cut off, the head be cut close down to two or three eyes, and planted out to establish themselves and get a year's growth.

The beds for the growth of American plants, and especially of this tribe, whether layers or seedlings, should be a foot and a half in depth, other soil being removed to make room for it, and the place well drained. Like many other

nursery plants, they may be planted pretty close while small, but they should be removed from one bed to another every second year, well trimmed into form; and if growth is wanted, the bloom buds should always be removed; and if they are allowed to bloom, the calyxes should be removed before the seed be allowed to swell; for strange as it may appear, the perfecting of the seed distresses a plant exceedingly, however small such seeds and pods may be. For this reason, even those plants which are in ornamental grounds, and are grown for the sake of the bloom, ought to have the decayed flowers removed before the pods can swell, as their removal promotes the growth and setting of the bloom for the next season.

Again, when American plants exhibit an extraordinary quantity of bloom, large quantities of water should be administered; and as many of the bunches of flowers will be found backward after the bulk of the bloom has gone, all these backward buds should be taken off at the same time that the remains of those already flowered are, that all the new growth may start at once. In removing the bloom stalks, care must be taken not to take enough away to remove the insipient buds immediately beneath the bunches, for on these depend much of the beauty of these shrubs the next year. This is also the time to cut in any straggling branches that are wandering out of their proper forms, for it will frequently happen that a branch will take to growing rapidly and drawing much of the nourishment from other portions of the plant; if this is seen while in an early stage of growth, it is better to pinch out the top at once. In seedlings and young plants, attention to this subject is highly necessary, for they will not unfrequently grow in one part only, while the other stands all but still, or quite so, and thus become ngly in the early stages.

It is a good plan to pinch the tops of seedlings (unless they are wanted for standards), and so keep them bushy and far more desirable than if their whole or possible growth were made in one branch. As soon as seedlings or young plants nearly touch each other, which would be the second or third season at most, they should every one be taken up, the bed dug over again and dressed with leaf mould, and the plants put in wider apart so as to leave room to walk between the rows, and in the rows there should be as much vacancy between as each plant occupies. Thus, if their extremities reach a foot, there should be a clear foot from the outside of one plant to the outside of the next, or two feet from centre to centre, and the rows should be two feet apart, and this removal should always take place be-

fore the plants touch, and at the extreme every three years. It is accompanied with labour but the plants are infinitely better for it, and worth more money, more than the difference of cost. These remarks apply to all the varieties. Let us now consider the best way of beginning to grow these plants.

Apply to any nursery for the large flowering kinds of the best varieties, and to Waterer and Smith, of Norbiton, for the best of the large flowering kinds they have raised, all well set with bloom. Let these grow together in a clump or border made of the soil we have mentioned. Never let them get too dry, but supply them liberally with water; if it be hot weather there will be no danger of missing seed which must be gathered just before the pods burst. Get seed pans or large flower pots, which being drained by small pieces of rough peat over the holes, may be half filled with the compost we have mentioned, chopped to pieces and rubbed through a good large sieve that would let marbles through, the remainder must be rubbed through a sieve that would barely let small peas through. This should be levelled very neatly, the seed sown thinly and evenly all over, and some more of the peat sifted through the finest sieve so as just to cover the seed which is as fine as dust or snuff. Stand the pan in water half way up for a quarter of an hour, before the soil is levelled to receive the seeds. It will retain moisture enough to come to the top, and save watering for some days. After the seeds are sown it may be removed to a cool shelf in the stove or a warm shelf in the greenhouse, or into a pit until the seeds are up. If the stove, they will be up soon, and in either case as soon as they are large enough to get hold of and handle well, they should be pricked out into pans or pots similarly filled, not more than half an inch apart, to grow until they are respectable little plants, and pretty nearly touch each other. They must never be dry, but they must from the first be watered with a syringe so fine that the wet must fall like dew, or it would disturb the seeds or seedlings in their early days. The cold frame or greenhouse is quite protection enough for them, when once up and growing, but they must not have any frost while young. When these are grown large enough to touch each other, you have merely a choice of whether you will prick them out further apart in other pots, or commit them at once to the open ground properly made up, as directed; here they may be planted out in the month of May at six inches apart, and be allowed water to refresh them in dry weather, hoeing to keep them clean and free from weeds, and then be attended to as regards future planting as directed before. Few people care about the form of seedling plants, being unwilling to lose an

inch of them or the chance of a bloom, until they see what flowers are produced, so that ugly or handsome they are allowed to grow their own way until their value is seen.

The great fault of many American plants is their bare stems, and in Azalias, this is as much a fault as in any plant we know of. This must arise from the carelessness with which four or five years' growth are allowed without attention. Indeed, when once seedling plants are bedded out, they are often left to grow until there is not a good shaped plant amongst them. Long naked stems, and a mere top of close growing blooming shoots—and we believe we are quite correct in saying, that at Waterer's American nursery, Knapp Hill, there are thousands of good things in the seedling bed where they were first planted out, and where they have been for years in each other's way. The nursery is, however, a magnificent sight in June, and we recommend every body who has a taste for either Azalias or other American plants, especially Rhododendrons, to pay a visit, for we doubt much whether there is such another sight in the kingdom.

With regard to grafting, the best method is by inarching, where it can be done, and but few, or perhaps only so many as the original plant can spare, be required, because you transfer a branch from the plant to a stock of *pon-ticum*, thus obtaining all the strength of a well established plant of three or four years old to a branch of strong wood, of whatever length it can be spared from the principal plant. This is performed, as in the case of *Camellia Japonica*, by cutting the stock half through, and the branch which you wish to join to it half through, and fitting them very closely and neatly together, these being tied in their places, the pots of the respective plants being where they will not be disturbed while they unite, and allowed to have a moderate degree of warmth, it will be found that as they grow they will unite. It is better, however, after having made them fit so that the bark touches each other some distance, to cut a tongue in each of the flat places, and to tuck one tongue into the other. It is, in fact, merely putting a sharp knife into the flat part, and cutting up a kind of thin wedge, the third of an inch long, as much sloping downwards as would make the piece lifted up as much of a wedge shape as a bit of the blade of a knife would be, then cut a wedge up on the flat side of the other piece, in the opposite direction, that is, to one cut upward, which would make the point or sharp end of the wedge downwards, and the other cut downwards, to make the sharp end of the wedge upwards; then, when the two flat sides are put together, one wedge is put under the other, and it keeps the join

much more steady; they are then to be held in their places, and bound very tight with bast matting or worsted, or some other tie equally strong and neat, and placed where they cannot be disturbed, until they have united, when the branch grafted on must be cut from its parent plant, just under the tie, and the growing part of the stock must be taken off, so that the whole strength of the stock will be thrown into the new plant, or rather into the graft. This is the favourite method of grafting favourite kinds, but there is no plan so good as laying to propagate this tribe, and no method of raising them in large quantity and variety as from seed.

Of the varieties to purchase by name it is difficult to say much; like all other subjects improved by saving seed and raising new varieties, so many are alike to ordinary observers that the directions we have given are decidedly the best we can give. An order to Mr. Waterer for his best varieties should be for the number you require. Not two at all alike, all to have broad petals and large flowers. The selection must be left to him. With regard to the Ghent varieties, the nurseries have already weeded out a number of the inferior kinds, but still, in ordering a collection of those, the condition should be none but large flowers, and not two alike. We are now, of course, speaking of varieties, for there is no harm in having a hundred plants of one variety, but we are opposed altogether to the plan of having two varieties so near alike to common observers, as to not strike them with a difference. There are colours and combinations enough to go a great way, even with one of each shade or colour. White, sulphur, yellow, deep yellow and orange, rose colour, darker pink, crimson, blood red, and scarlet, lilac and purple. Then there are many with two of these colours combined. Any one might grow with pleasure twelve of the Ghent varieties, as many of Waterer's, and half as many of the true American varieties originally imported, but we cannot repeat too often, that they might (except in any particular instance when the parties see a thing in bloom, and like it) safely forbid any one of the small flowering kinds to be included. It may be answered by those who value things differently, that some of the smaller ones bloom later, when all the larger ones have gone by; but who cares about an Azalia flower at that period? Flowers of all kinds begin to be plentiful when the handsomest of the Azalias go out, and the trimper little flowers of some of that nevertheless beautiful tribe would be lost, except in very large, very general, and separate collections, arranged in a regular American garden—which, by the way, considered, is but an

ephemeral object—while a judiciously mixed shrubbery may be made by the help of Americans, a noble and beautiful object at all times of the year. The principal varieties, according to the estimation of the nurseries, may be set down as under:—

#### HARDY IMPORTED PLANTS, AMERICAN AND TURKEY.

<i>Aurantia Major</i> . . .	Orange.
<i>Coccinea Major</i> . . .	Scarlet.
<i>Pontica</i> . . .	Yellow.
<i>Pontica Alba Flora</i> . . .	White.
<i>Pontica Cupræa</i> . . .	Copper.
<i>Pontica Palida</i> . . .	Pale Yellow.
<i>Pontica Vercicula</i> . . .	Rose and Yellow.

#### GHENT VARIETIES, BEING HYBRIDS OR SEEDLINGS RAISED AT GHENT.

Adelaide, Alba flavescens rosacea, Alexandria, Ardens, Backii, Badia, Belle-rosetta, Comitissa flaudria, Concinna, Cordor, Cruenta, Cuprea splendens, C. eximea nova, Decus-hortorum, Dianthaflora, Duchess de Parma, Dulcedo, Electa, Elegans Morteri, E. tardiva, Ferdinando, Flora provincialis, Genis Morteri, Gloriosa, Guillemus primus, Honesta, Incundo, L'imperatrice, Morteri, Ne-plus-ultra, Nilens, Nymphaea, Optima, Perfecta, Pictura subtilissima, Tricolor, Præstantissima, Prænitas, Princeps Marion, Punicea, Purpurea Grandiflora, Rava, Rosa-sineusis, Robutsa, Rubracata, Seraphina, Victoria modesta.

#### WATERER'S SEEDLING VARIETIES.

Adelaide Æstivalis capriflora, A. Concinna, A. Interest, A. Ornata, A. Rubro crocea, Amabile, Amæna, Aurea, A. Crispa, Aurantiaca, A. Coccinea, A. Superba, Calendulea coccinea, C. Elegans, C. Eximea, Candida, Candidissima, Cliveana, Carnea delicatissima, C. Elegans, Coeli rosea, Colorata, C. Macrocephala, Coronaria, Crocea distincta, C. splendida, Elegantissima, Globosa compacta, Gloria mundi, G. patria, G. triumphans, G. universalis, Grandissima, Iguescens, Incana, Imperialis maxima, I. superba, Incarnata crispa, I. superba, Læritia stellata, L. striata, Mirabilis, M. grandiflora, Monstrosa fascicularis, M. variabilis, Nudiflora læta, Ornata rosea, Penicellata stellata, Plumosa, Pontica compacta, P. grandiflora, P. flavicomma, P. multiflora pallida, P. macrantia, P. mirabilis, P. princeps, P. Salmonæ, P. Zebrina, P. Watererii, P. Sulphurea ornata, P. S. dissecta, P. S. grandiflora, P. S. grandissima, P. S. Pallida, Pulcherrima, Rubescens Speciosa, Rubra-marginata, Saltatoria, Specula, Spectabilis, Speciosa aurea, S. conspicua, S. atro-sanguinea, S. hæmantha, S. pulchella, Strophantha, Translucida, Viscocephala, Vittata, V. conspicua.

## AMERICAN APPLES.

WE resume this article, which, in fact, was too long to go in all at one time.

60. *Murphy*;—striped, and red, ovate, medium size, Table, first quality, November to February, juicy, highly esteemed, and resembles the Flushing Spitzenburgh.

61. *Nonesuch, Hubbardston*;—red and yellow, ovate, large size, Table, first quality, December to March, very productive, juicy, delicious, and one of the most esteemed.

62. *Nonpareil American*;—striped, yellow and red, oblong, medium size, Table, first quality, Oct. and November, very productive, juicy, firm, fine flavour, and beautiful.

63. *Paragon, 50 cents*;—pale and yellow, roundish, large size, Table, first quality, Oct. to March, very productive, juicy, very large and splendid, and high flavoured.

64. *Paradise Summer*;—pale and green, roundish, large size, Table, first quality, Aug. and Sept., very productive, agreeable flavour.

65. *Pear-lot*;—red, flat, medium size, Table and Kitchen, second quality, September, favourite for kitchen.

66. *Pearmain, American Summer*;—striped, red and yellow, oval, medium size, Table and Kitchen, first quality, Aug. and September, very productive, juicy, rich and excellent flavour, one of the best of the season, and ripens gradually.

67. *Pearmain, Federal*;—green and red, pearmain shaped, medium size, Table and Kitchen, first quality, November to March, very productive, juicy, agreeable flavour.

68. *Pearmain, Gardner's Sweet*;—red and yellow, pearmain shaped, large size, Table and Kitchen, Oct. to Feb., an esteemed variety.

69. *Peck's Pleasant*;—yellow and red, Table, first quality, Nov. to Mar., agreeable flavour.

70. *Pennock's Red Winter*;—red and yellow, flat, large size, Table, first quality, November to March, very productive, juicy, a splendid and estimable variety.

71. *Pippin, American*;—red and yellow, flat, medium size, Table and Kitchen, first quality, January to June, very productive, juicy, much esteemed for cider, agreeable flavour.

72. *Pippin, American Golden*;—pale and yellow, roundish, large size, Table, first quality, Nov. to March, agreeable flavour.

73. *Pippin, Michael Henry*;—pale and yellow, oblate, medium size, Table and Kitchen, first quality, November to May, very productive, juicy, high flavoured and handsome.

74. *Pippin, Monmouth*;—green and red, flat, large size, Table, first quality, November to Mar., very productive, a new Jersey variety.

75. *Pippin, Monstrous*;—pale, green and white, roundish, large size, Table and Kitchen, medium quality, October to January, very productive, juicy, has weighed 28 oz. The most showy of all apples. Rather coarse for table, but esteemed for kitchen.

76. *Pippin, Newark*;—pale and yellow, oblong, medium size, Table and Cider, first quality, October to December, very productive, juicy, firm, rich, high flavoured, fine for cider.

77. *Pippin, Newtown Green*;—green, roundish, medium size, Table, Kitchen and Cider, first quality, December to May, very productive, juicy, high flavoured, and long keeping, the most valuable for market and export.

78. *Pippin, Newtown Yellow*;—yellow and red, roundish, large size, Table, Kitchen, and Cider, first quality, Dec. to May, very productive, juicy, scarcely secondary to the preceding in value.

79. *Pippin, Ortley*; yellow, oblong, medium size, Table, first quality, December to April, very productive, juicy, much esteemed, flavour same as Newtown Pippin.

80. *Pippin, Pickman*;—pale and yellow, round, medium size, Table and Kitchen, first quality, December to March, very productive, juicy, excellent for kitchen.

81. *Pippin Red Sweet*;—dark and red, round, medium size, Table and Kitchen, second quality, December to May, firm, rather dry, keeps well.

82. *Pippin, Republican*;—Table, first quality, excellent, rather mealy.

83. *Pippin, Warren or Varmin*;—yellow, oblong, large size, Table, first quality, Nov., juicy, handsome and sprightly flavour.

84. *Pommewater*;—pale and yellow, round, large size, Table and Kitchen, first quality, Nov. and Dec., juicy, excellent.

85. *Pompion*;—yellow, oblate, large size, Table and Kitchen, medium quality, September, very productive, sweet and pleasant.

86. *Porter*;—yellow, conical, large size, Table, first quality, September, very productive, much esteemed.

87. *President*;—Table, first quality, rather mealy.

88. *Priestly*;—striped, oblong, large size, Table and Kitchen, first quality, December to April, very productive, juicy, pleasant spicy flavour.

89. *Prince's Yellow Winter*;—pale and yellow, oblate, large size, Table, first quality, November to April, very productive, juicy, a very estimable variety.

90. *Rawle's Janet*;—pale yellow, oblate, small size, Table, first quality, Jan. to May, very productive, juicy, very superior flavour, and keeps late.

91. *Rambo* or *Romanite*;—red and yellow, flat, medium size, Table and Kitchen, first quality, Sept. to Nov., very productive, juicy, a favourite for kitchen.

92. *Ramsdell's Red sweet*;—deep red, ovate, large size, Table and Kitchen, first quality, November to January, very productive, beautiful and rich flavour.

93. *Redling*;—red, oblong, medium size, Table, first quality, January to May, very productive, resembles Priestly.

94. *River*;—Table, first quality, Autumn, excellent, rather mealy.

95. *Russet, American Golden*;—yellow and russet, ovate, medium size, Table and Kitchen, first quality, October to Jan. very productive, juicy, much esteemed.

96. *Russet, Boston*;—yellow and russet, oblate, large size, Table and Kitchen, first quality, December to July, very productive, juicy, a famous and highly esteemed market fruit. Keeps till late.

97. *Russet, Broune's Imperial*;—yellow and russet, oblong, large size, Table and Kitchen, first quality, November to February, very productive, the most splendid of russets.

98. *Russet, large sweet*;—russet, large size, Table and Kitchen, first quality, October, very productive, much esteemed: there is an inferior English variety.

99. *Russet, Putnam's*;—russet, large size, Table and Kitchen, first quality, very productive, much esteemed.

100. *Russet Shippen's*;—yellow russet, flat, large size, Table and Kitchen, first quality, October to February, very productive, much esteemed for kitchen.

101. *Russet Summer*;—russet, oblate, medium size, Table and Kitchen, second quality, lity, September, excellent flavour.

102. *Russet, Worcester*;—russet, Table and Kitchen, rather mealy.

103. *Saint Lawrence* (Corse);—large size, Table, first quality, Sept., beautiful Canada variety.

104. *Seeknofurther, Autumn*;—striped, yellow and red, conical, large size, Table and Kitchen, first quality, Oct. and Nov., juicy, flesh, yellow and excellent

105. *Seeknofurther, Green*;—yellow and green, oblong, large size, Table, first quality, Nov. to Jan. very productive, juicy, a pleasant early winter variety.

106. *Seeknofurther, Red*;—dark and red, round, medium size, Table and Kitchen, first quality, Oct. to March, very productive, a good variety.

107. *Seeknofurther, White*;—white, flat, medium size, Table, second quality, Oct. to Feb. very productive, moderate flavour.

108. *Sine qua non*;—pale and green, round-

ish, medium size, Table and Kitchen, first quality, August, very productive, juicy, pleasant, spicy flavour.

109. *Smoke House*;—Table, December and March, rather mealy.

110. *Somerset Harvest*;—pale and yellow, ovate, large size, Table and Kitchen, first quality, July, very productive, juicy, pleasant sub-acid flavour, similar to early harvest.

111. *Spitzenberg, Esopus*;—scarlet and yellow, oblong, large size, Table and Kitchen, first quality, Oct. to Feb., very productive, juicy, beautiful, flesh yellow, sub-acid, with high aroma, an unrivalled variety.

112. *Spitzenbergh, Flushing*;—dark red, conical, large size, Table and Kitchen, first quality, Oct. to March, very productive, juicy, skin dotted with white, and covered with a bloom, flesh white, sweet and aromatic, much esteemed.

113. *Spitzenberg, Newtown*;—yellow and red, oblate, medium size, Table, second quality, Nov. to Feb., very productive, juicy, sweet and mild flavour.

114. *Spitzenberg, Pownal*;—red and white, flat medium size, Table, first quality, December to March, very productive, juicy, a very superior variety.

115. *Spitzenberg, White*;—white, large size, Table, first quality, Nov. to Feb. very productive, fair, beautiful and high flavour.

116. *Stroat, or Straat*;—yellow and green, conical, large size, Table, first quality, Sept. to January, very productive, juicy, rich and excellent.

117. *Summer Queen*;—striped, red and yellow, roundish, large size, Table, medium quality, August, very productive, rich, high flavoured, excellent.

118. *Summer Rose*;—striped, yellow and red, oblate, medium size, Table and Kitchen, second quality, early in Aug. very productive, juicy, beautiful and excellent.

119. *Surprise, or Bloody*;—yellow, roundish, medium size, Table and Kitchen, first quality, October to January, very productive, juicy, red, flesh, a curiosity.

120. *Swaar*;—yellow, roundish, large size, Table, first quality, Nov. to February, very productive, juicy, very solid, first-rate, a favorite with the Dutch.

121. *Sweeting, Corlies*;—yellow and red, oblong, large size, Table and Cider, medium quality, Sept. to Nov. very productive, juicy, greatly esteemed for cider.

122. *Sweeting, Hartford*;—red, large size, table, first quality, Oct. to Feb. very productive, juicy, pleasant flavour, grows slow, and pendulous.

123. *Sweeting, Ladies*;—striped, conical,

large size, Table, first quality, Nov. to May, very productive, a valuable variety.

124. *Sweeting, Mackay*;—pale and yellow, globular, large size, Table, first quality, Dec. to April, very productive, a fine Massachusetts variety.

125. *Sweeting, Orange*;—yellow, oblate, medium size; Table, first quality, September to December, very productive, excellent and greatly esteemed.

126. *Sweeting, Pumpkin*;—striped, yellow, and red, pearmain, large size, Table and Kitchen, medium quality, Aug. very productive, juicy, very large and tender, sweet, pleasant.

127. *Sweeting, Red and Green*;—green, yellow and red, oblong, large size, Table and Kitchen, first quality, Aug. and September, very productive, mealy, an excellent sweet fruit, and often weighs a pound.

128. *Sweeting, Red winter*;—dark and red, flat, large size, Table, first quality, October to Feb. very productive, juicy, pleasant flavour.

129. *Sweeting, Sawyer*;—green and red, oblate, large size, Table, first quality, October and November fine flavour.

130. *Spice, sweet*;—large size, Table, first quality, Sept. very productive, beautiful, and excellent. A New England variety.

131. *Superb sweet*;—large size, Table, first quality, Sept. to Dec. very productive, a superior fruit.

132. *Tetofsky*;—yellow, oblong, medium size, Table, first quality, Aug. very productive, Russian, handsome.

133. *Tewkesbury winter blush*;—yellow and red, round, small size, Table, second quality, December to June, very productive, juicy, fair, handsome, and sprightly flavour.

134. *Townsend*;—striped, roundish, medium size, Table, second quality, Sept. to Oct.

135. *Tunis*;—pale and yellow, round, large size, Table, medium quality, Nov. to Jan.

136. *Vanderneer*;—yellow and red, flat, medium size, Table, Kitchen, and Cider, second quality, Dec. to March very productive, rich and sprightly, much esteemed for kitchen.

137. *Wax, Autumnal*;—yellow and red, oval, medium size, Table, first quality, Oct. very productive, juicy, a beautiful variety.

138. *Wells Sweet*;—pale and yellow, oblate, large size, Table and Kitchen, first quality, Nov. to January.

139. *Wine American*;—red and yellow, roundish, large size, Table and Kitchen, second quality, Oct. to Jan. very productive, juicy, excellent flavour for kitchen and cider.

140. *Winesap*;—red, roundish, medium size,

Table and Cider, second quality, September to January, very productive, juicy esteemed both for table and cider.

141. *Winter Queen*;—medium size, Table, first quality, Nov. to March, very productive, juicy, an estimable variety, pleasant and sprightly.

142. *Williams' Early*;—red, oblong, medium size, Table, second quality, Aug. very productive, a New England variety.

143. *Woolman's Harvest*;—striped, medium size, Table, first quality, July, very productive, esteemed.

144. *Yellow Superior*;—pale and yellow, oblate, medium size, Table, first quality, winter, very productive, juicy, excellent flavour.

All these may be had of those houses which profess to import, such as Charlewood's, Covent Garden; Carter of Holborn, and others connected with America.

#### ON THE ETHIOPIAN ARUM.

THE *Calla Æthiopica* of Linnæus, now called by Kuntz, the Prussian botanist, *Richardia Æthiopica*, or the Ethiopian Arum, and which name has been adopted by Loudon, in his *Hortus Britannicus*, is a native of the Cape of Good Hope, and is much cultivated in our greenhouses.

It is a plant of easy culture, and few plants can bear such a variety of treatment; it is naturally a marsh plant, but it is able to live with little or no water. It should be potted according to the size of the plant, in a pot of No. 12, No. 8, or occasionally of No. 6, in rich garden mould, and will flourish with very little care: few plants thrive better in a room than this one, and if near a south window will flower well, indeed when well grown will flower several times in the course of the summer.

The flower, if it can be so called, for the botanist considers it only as a spathe, and that it has no corolla, is large and white, and continues for a considerable time, but has little fragrance. It bears forcing well, and by being put into the hothouse or stove it will flower as early as March or April, and in this way nurserymen have generally one or more of them in flower in their greenhouses.

These plants seed readily in the greenhouse, and young plants can be raised either from seeds which I have done myself, or it may be increased by taking off suckers from the old plant. As the plants raised from seeds are about three years before they produce flowers, this mode is seldom practised.

As the plant is much in demand, nurserymen have sometimes a difficulty in raising a sufficient number of plants—a few plants may however always be obtained by cultivating it

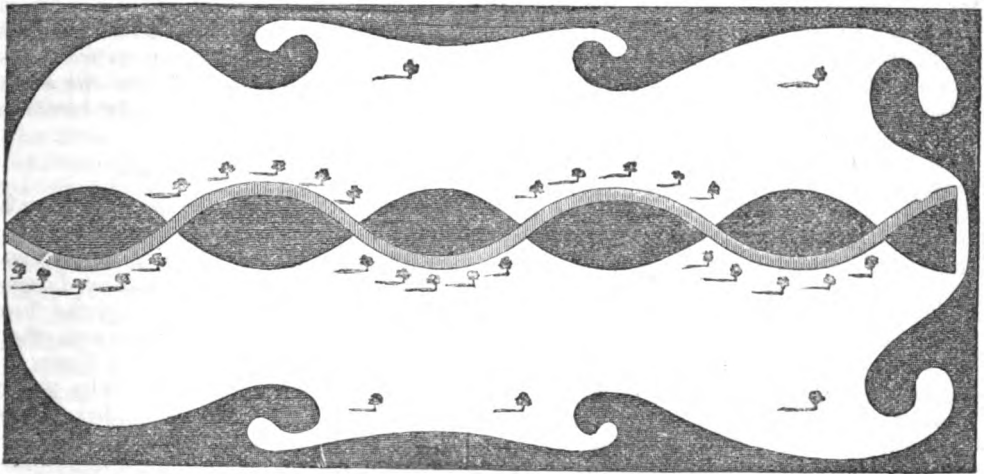


as a water plant, putting it in a cistern, or keeping its flat well supplied with water, but it may not be so generally known that if the plant is at the end of the season gradually stinted of water, it will get into a dormant state; water may then be entirely withheld, and the plant should then be placed on the back shelves of the greenhouse, or if more convenient, in a dark cellar, where it will be safe from frost. If allowed to remain here during the winter or for four or five months, it will be found when examined in the spring to have thrown out small bulbs; these are young plants, and may be either taken off and grown separately, or which is probably the safer way, may be allowed to remain with the old plant when again brought into growth in the greenhouse, they will throw up leaves, and will of course be treated like ordinary suckers, and separated when they are of a middling size.

I mentioned above, that on one occasion I raised the plant from seeds, which had ripened with me; there is little difficulty in managing the young plants, but I found that they much sooner acquired size by treating them as water plants, and by plunging the pots in a small

cistern I very soon brought them to be good sized plants, but it was still the third year before I was able to bring them into a flowering state, so that except increasing the number of my plants, I did not obtain any other object.

I know that some persons have occasionally difficulty in flowering them in the house, but in my opinion this is caused by giving them too much water, that is by allowing the water to remain in the flat under them, which makes them grow to leaf and not to flower; if the plant is in good health after being kept in a growing state in the spring, less water was given, the flower will very soon make its appearance, and afterwards if properly treated by being placed near a south window, and getting air occasionally, a succession of flowers may be obtained during the summer. The plant is occasionally planted in the open border, where it will stand well enough, but will hardly flower, except it has been previously grown well in the greenhouse, and I do not think it a plant which will ornament the flower garden, except it can be made to flower there, and it must be housed before winter.



#### LAYING OUT GARDENS.

THE plan here presented partakes of the uniform and the landscape kind of gardening, and as one confined between narrow limits affords a variety which is by no means unappropriate. We know the late Mr. Loudon used to object to serpentine walks where the limits were small and the sides parallel; his remarks on the laying out of the gardens at Chiswick where the hall was built for shows, explained his views upon the subject, but we may be supposed to dissent from them when we invariably do all we can to avoid a

straight walk. We do not like the serpentine walks carried out as this is, but it is one of a choice of evils which every narrow slip of ground is subject to, and as such we give it in the collection, for at this moment thousands of such slips of ground are parcelled out for building, and tens of thousands are already existing, as the only gardens to suburban residences. We have no doubt each, of the numbers we intend to give, will have its approvers, and every one of those we have already given, has been carried out in more

places than we care either to record or remember; indeed, we are constantly resorted to by persons interested in such matters, and we have done more than we shall ever be able to publish. In the shrubbery, in conspicuous places, on the lawn, or in clumps, as well as in borders, many subjects of great beauty might be placed. Among the most showy and elegant let us recommend Rhododendrons, Azalias, Andromedas (Arborea and Florabunda), Kalmias, (latifolia and glauca), Pyruses Japonica (red and white), Garrya Eliptica, Althea Frutex, Arbutus, Magnolia (the dwarf varieties), Berberis, or as it is now called, Mahonia, Cytisus (varieties), Persian and other dwarf sorts of Lilac, Cistus (varieties), Calycanthus, Deutzia, Daphne, Ribes (varieties), Tree Peony, and others, all capable of even pot culture, and all flowering. If we once talk of evergreens and tall trees, we must take in all the varieties of Holly, Box, Cedar, Arborvitæ, Pinus, Thorns, Mespilus, Araucaria, several tall growing Magnolias, and fifty other things, all of which belong to the back ground or next the wall.

#### GLENNY ON FLORISTS' FLOWERS.

As it seems to be the wish that I should supply a series of articles on these the elect of Flora, as a kind of introductory subject for young amateurs, I take leave to announce that the foundation of my opinions are the rules already published in the "*Gardener and Practical Florist*," and having for the last few weeks been favoured with the opinions of many very excellent judges who have favoured me with lists from all parts of the country, I have abundant evidence that they, in their selections have adopted the same rules: that is to say, that in Panseys they have considered the circle to be perfection, and that thickness of petal, smoothness of edge, flatness of flower, sameness of ground colour in the three lower petals, well defined marking, freedom from flushing, and respectable size, are all requisites. I by no means wish to say that the varieties mentioned will all prove so, but they are chiefly valued for the number of these points they possess as compared with others. I am further confirmed in the correctness of my original opinions on these subjects, by the fact that there are those who have affected to teach people the properties of the Pansey, and who although not fair enough, I was going to say honest enough, to quote the rules I had previously laid down, have given the same rules in other words, and pretended they were original. Vary from them they could not without being wrong, and had the parties been of any standing or character as writers, they would have done as other respectable writers have

done, say where they derived their information. However, this digression is chiefly to let the readers of this work know that although they may see in some works the identical properties which have been laid down here, and even published before this work was established, they are to recollect or be informed, that I drew up these rules between 1832 and 1837 for the Metropolitan Society, and that they are for the first time collected in the "*Gardener*" with the properties of additional flowers; therefore that the unfairness of those would-be authors who preceded this, arises out of their copying me from other works. However, I dismiss this subject with the simple expression of regret that as well as writers who would condescend to this meanness, there are editors who so far descend as to give place to their effusions as original communications. There is scarcely any flower of which so little is known in one locality of what is doing in another as the Heartsease, therefore in giving a list of a few which people who desire to exhibit should possess, it must be recollected that I take them only from those which are current among exhibitors and dealers, and I give them knowing that many have reached me anonymously which are actually better, but which have not yet become known among dealers, nor among any of the amateurs round the metropolis. On this account I regret I ever gave an opinion without having the grower's name, and the name he intended to call the flower; for I have in my remembrance,

"In my mind's eye, Horatio,"

several that would beat anything we have in their way. The collective opinions of the principal growers give the following as the Panseys which stand highest in estimation. I ought to explain that of ten growers, all giving their opinions separately and unknown to each other, the number against the name of a flower represents the number of growers who placed them in the best list of a given number. These comprise all that had two votes which in fact indicate that two people out of ten think them among the best twenty-four. There can be no doubt about most of them being tolerably good, and indeed as I can recognise some very pretty flowers among those which have only two votes, I have very little doubt that the collection just as it stands would prove satisfactory to a beginner, and that any of them not already possessed by a grower might be safely added to his collection:—

Miss Stainforth . . . 8	Flora McDonald . . . 5
Curion . . . . . 6	Black Eyed Susan . . . 5
Lass of Brechin . . . 5	Daniel Defoe . . . . . 5
Gypsey . . . . . 5	Rhoderic Dhu . . . . . 5

Sir Andrew Wylie . . . 5	Prince Albert	ten persons who vote as to the best twenty-	
Mulberry Superb . . . 4	(Cook) . . . 2	four varieties, the following is the result:—	
Exquisite . . . 4	Corunna . . . 2	this is worth attention, because it brings us	
Sulphuria Elegans . . . 4	Marmion . . . 2	pretty nearly to the merits of the flowers.	
Regulator . . . 4	Angelica . . . 2		
Eclipse . . . 4	Mirror . . . 2	Bridesmaid . . . 10	Dodd's Favourite . . . 4
Laird of Logan . . . 4	Victory . . . 2	Prince of Wales . . . 10	Marchioness of
Queen Margaret . . . 4	Volney . . . 2	Admiral Stopford . . . 10	Exeter . . . 4
Triumph . . . 3	Countess of Orkney . . . 2	Essex Triumph . . . 10	Admirable . . . 4
Black Bess . . . 3	Mrs. Hooper . . . 2	Mrs. Shelley . . . 10	Sir R. Sale . . . 4
Bridegroom . . . 3	Cyclops . . . 2	Antagonist . . . 10	Northern Beauty . . . 3
Black Prince . . . 3	Rob Roy . . . 2	Mrs. Richardson . . . 9	Perpetual Grand . . . 3
Prince of Wales . . . 3	Jewess Superb . . . 2	Indispensable . . . 9	Blanche Shelley . . . 3
Venus . . . 3	Vandyke . . . 2	Phenomenon . . . 9	Lady Harland . . . 3
Prince Charlie . . . 3	Mountain Sylph . . . 2	Princess Royal . . . 9	Maid of Bath . . . 3
Desirable . . . 3	Imogene . . . 2	President of the	Sir F. Johnstone . . . 3
Duke of Northum-	Jehu . . . 2	West . . . 9	Argo . . . 3
berland . . . 3	Prince Albert	Metella . . . 8	Miss Abbott . . . 3
Jeanie Deans . . . 3	(Hooper) . . . 2	Maria . . . 8	Pamplin's Blooms-
Alicia . . . 2	Nymph . . . 2	Beauty of the Plain	bury . . . 3

I now proceed to Dahlias without any other notice than reminding the reader that the Dahlia is the most treacherous of all flowers, or at least that from the great number of the blooms and the small number showable it would seem so. This leads many in giving their opinion to vote for those flower which are most constant, in preference to those which are the finest models or most beautiful colours. I present therefore a list of the greatest favourites in the first place, and the finest models and colours the most uncertain in the next place. I shall place first the opinions of thirteen growers, as to the flowers which should be considered belonging to the best twelve.

Mrs. Shelley . . . 11	Bridesmaid . . . 4		
Antagonist . . . 11	Indispensable . . . 4		
Essex Triumph . . . 11	Catleugh's Eclipse . . . 4		
Princess Royal . . . 10	Rouge et Noir . . . 4		
Admiral Stopford . . . 9	Sir R. Sale . . . 3		
President . . . 8	Burnham Hero . . . 3		
Phenomenon . . . 7	Metella . . . 2		
Beauty of the Plain . . . 6	Vivid . . . 2		
Widnal's Queen . . . 6	Duchess of Rich-		
Prince of Wales . . . 6	mond . . . 2		
Springfield Rival . . . 5	Grand Boudine . . . 2		
Bedford Surprise . . . 5	Cox's Defiance . . . 2		
Lady Cooper . . . 5	Pickwick . . . 2		
Competitor . . . 4			

Among, however, the flowers which have only a solitary vote from the whole thirteen growers, I find Hope and Unique, and among the rejected altogether I notice Exquisite, Conqueror of the World, Egyptian King, Glory of Plymouth, Scarlet le Grand, and Lewisham Rival, owing to nothing but their glorious uncertainty, which indeed is so great, as to discourage any moderate grower. Among

It will be presumption, perhaps, in me to say that I differ from this list in some particulars, but in the aggregate it will not mislead much—indeed, those which have the numbers as high as five cannot be very much amiss; nevertheless, even they do not take in all I would grow, though it brings in some of the neglected. I observe in these recorded opinions of ten excellent growers, a strong confirmation of the accuracy of the descriptions I have given at various times; yet there is a good deal in fashion and novelty to make even good judges swerve, and although nothing very materially wrong can be done with this latter list for a guide, some of the flowers which at present stand high will change places in the season. There is one thing to be said, of all the list there is no flower in that is un-

fit to show, and none that have not won. But so far as I am concerned, if I only grew a dozen varieties, the Conqueror of the World should be one, if I only got a bloom once in seven years. It will be observed from this list, that Nicholas Nickleby, a flower which I rejected as unworthy of a prize, much to the annoyance of the owner—one which, owing to its constancy, has been shown more times, and spoiled more stands, than any other flower during its reign—has at length found its place. Had it been like many others, uncertain, it had been nothing to see that, more than others, go out of fashion, but a bloom can be cut at any time as good as it can come, and it took me some trouble to open people's eyes to the fact, that it spoiled every stand it was put into.

There are many other flowers, absent and present, which I have said a good deal about, and few there are which do not prove by their position that I am not far out in my opinion of seedlings. If I add the pink to this article it will be too long; I therefore propose to conclude it by mentioning Glory of Plymouth, Conqueror of the World, Egyptian King, Scarlet Le Grand, Empress of the Whites, and Countess of Pembroke, as six of the uncertain and almost hopeless flowers, which I would never abandon until convinced beyond all doubt I could not grow them, and that would only be when I had exhausted all my patience in experiments: but they are certainly not fit for growers of limited collections anxious to show, for the chances are ten to one against their producing a bloom, however gratifying that bloom may be when it is produced.

#### CUCUMBERS AND MELONS FROM SLIPS.

It is easy to imagine that a fruit like a Cucumber or Melon, which being dependent on its own seed for its continuance, may some of these days be quite lost; and I can the more easily foresee the possibility of this from a circumstance which happened to myself. I had Mr. Weedon's sort of Cucumber, and grew one of the finest fruit I ever saw in my life: this was full of seed. I allowed it to ripen; there was nothing like another kind for a long distance. I sowed the seed of this fruit, and there was not in twenty-four plants, two plants quite like the original. Vexed and mortified, and living at a large distance, I could only grow what I had, and although many were fine and none bad, I had not the true sort in all respects, except in one solitary plant. I have since that kept up a constant stock of cuttings, and I strongly recommend the selection of each of the first-rate kinds where they are known to be correct,

and a stock to be struck and kept up by nurseries, instead of depending on seed. I have found them generally sooner in fruit, equally prolific always, and often much more so; for I am convinced that we are gradually getting wider of the mark with several of the very best kinds, both in Melons and Cucumbers. I do not say we may not have better instead of worse occasionally, but, the exact kind is not to be answered for one time in a score. The striking is so simple that they require no other care than cutting at a joint, to insert it in the ground and have a joint above the soil to grow; then put in a pot of common soil and placed in the frame are sure to strike. The surplus, after using all you require for the frame fruit, should be placed out in ridges in the open ground, and early in September, any time before the frost comes, cuttings may be taken and struck for future stock; for there is no difficulty in cutting Cucumbers the whole year round, and these cuttings may be got ready to put out in new pots before the end of October, or be continued under proper treatment for later periods. **AN OLD CUCUMBER AND MELON GROWER.**

#### SILVER SAND FOR STRIKING CUTTINGS.

THE practice of a successful cultivator is more frequently imitated than understood, and when it is considered that very few, comparatively speaking, trouble themselves to investigate very closely the theory of their operations, it is not surprising that various reasons are assigned for the same practice, and not unfrequently, some very erroneous ones. As an illustration of this I may instance the use of Silver Sand in the Striking of Cuttings, and give the following as the practice and opinion of a very successful nursery propagator. His plan is to take a small flower-pot and fill it up with any prepared soil, then pressing the forefinger down the centre of the pot to the full depth the cutting would go, and filling up the hole made by the finger with pure sand, and then inserting the cutting among the sand, and gently pressing the soil on every side of the plant until sufficiently firmed, when the operation is completed. Now his theory is this—that in transversely cutting the tissue of a plant, there are certain vessels opened, and certain fluids released, which if not provided with a means of escape from the base of the cuttings either completely destroys the plant, or considerably protracts and retards its rooting, but the sand acts as drainage and conducts the deleterious fluids to a safe distance. Another reason assigned to the success attending the use of sand in propagating is, that a plant always succeeds best in forming roots where the

action of the external air is perfectly excluded, and sand being a substance which adheres so closely together is admirably adapted to work the desired effect. In this case the sand is applied in a layer over the whole surface of the pot or whatever is used, while the base of the cutting is often placed in the soil below the sand. In reference to the first of these theories it must be remembered that we find such succulent and juicy plants as pelargoniums, dahlias, &c., rooting freely in a comparatively adhesive soil—when such dry and hard wooded plants as erica epacris, &c., will rarely root in any compost more tenacious than sand, thus we find those plants from which we might expect the greatest flow of fluids by the wound, require the least means to rid them of their super-incumbrance, while those comparatively dry in texture, require the greatest means to drain away the moisture. With regard to the second it must be observed that we cannot exclude the atmosphere by a stratum of sand, if our cuttings be inserted beyond the sand, or at least, if the rooting depend on the exclusion of air, we cannot accomplish our wish by such a process.—Having thus raised objections to both propositions, we will, in fairness to the several advocates, give our own reasons, and which are, that sand being a substance which does not readily part with borrowed heat, it is the best calculated to maintain a regular temperature, that as it will only hold a certain quantity of water in its constitution, it freely affords a passage for superfluous moisture to escape, and above all, that it never consolidates into a mass, and thereby more freely admits the formation and extension of the embryo roots. Hence we find sand a substance best adapted to keep a mean temperature, the medium quantity of moisture, and to facilitate the formation of roots—all of which are indispensable to the successful propagation of plants.

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#### LONDON GARDENS.

THE ordinary cry of “nothing will grow in our garden” is perhaps as groundless as any other of the many errors which are committed by the ignorant, and we will not allow that the most smoky place in London need be without something like a garden. It would be idle indeed to pretend that plants and flowers would grow well without air and sun, but that much more might be done than is done with our squares and gardens among the smoke is certain. We remember, indeed, in our boyish days forming a garden with its beds and walks in the very heart of London,

where close rows of houses as far as the eye could reach all round from the top of our domicile, prevented us from seeing anything in the form of vegetation, except in pots at the windows, but ours happened to be one of the old fashioned houses which had its allotment of ground at the back, and we were permitted to call ours a garden, while all the neighbours called theirs yards, and (to keep us out of other mischief) allowed to do as we pleased with the ground. Our first essays were like those of most London gardeners, we bought roots at Covent Garden market, and seeds at any of the shops we happened to find. The plants mostly drooped and died, but the seeds, however diminutive the plants they produced, did their office in a small way, and opened our eyes to the different fate of marketed plants, and plants produced in the ground itself; for although we transplanted seedlings with impunity, we could not make the plants we bought, stand any time, and if they were flagging they rarely recovered themselves. We, however, under the advice of friends in the country, bought our plants at a different season, and at a nursery instead of market, and for years continued to improve the appearance of our little concern of gardening. Imitating our friends, the market gardeners, we left some portion up in ridges in winter, and as all young gardeners will do, we knocked and stirred about the soil in the most extraordinary way, and by the time we had got through the second year, we found, that although every thing grew stunted as compared with the country, there was hardly an annual that would not grow and bloom; things under glass did infinitely better, and enough was done to give all the features of a garden, however farcical a comparison of the productions with anything grown at the edge of a town or near it would have been. But there was a sunny and a shady side, and a marked difference in the productions; by trying all things we soon found which was the best for both, and seven years' perseverance, increased rather than damped our ardour for London gardening. There was no difficulty in growing things after the third year, for then it was for the first time we knew anything about the necessity of draining, and this being an operation beyond our knowledge, was undertaken for us; all we knew was that it was too wet, and especially in winter time, and that afterwards it was infinitely better for every thing. One of the grand operations in a London garden is the liberal use of the syringe, for the blacks which fall and cover the leaves do infinite damage, but unless the ground is drained thoroughly it is next to impossible to put it in good order. It need hardly be told that it is greatly to the

advantage of anything to buy it half grown, and that stocks, China-asters, and mignonette, bought by the hundred at the suburban nurseries at the proper time for planting out, grow much better than those actually raised on the spot. The *acuba japonica*, common laurel, and other shrubs, remove well, and at a proper time, lived for years, though they made small growth; but plants merely balled or potted up for market and sold there, rarely recover at all. The first object therefore in a London garden is to drain it well, we speak now of the mere bits of ground behind the houses. The next is to see that the soil is something moderately good; it may then be laid out in beds and gravel walks, and planted with a few shrubs such as we have mentioned, for flowering shrubs generally do not flower a second year, because they hardly make growth enough. However, during winter-time, there is but little to take care of beyond syringing the dirt and soot from the leaves. Seeds of annuals may then be sown when they are to bloom, such as convolvulus, larkspurs, sweet-peas, *nemophylla*, virginia stock, venus's looking-glass, and as a general preference, all rapidly growing and short lived things; then if you have any friend out of town to get up others for you, such as stocks, mignonette, China-aster, and other things usually raised in hot-beds, so that you may plant them out in May and June, it will greatly help you. Then with regard to spring flowers which should be provided for in autumn: you should get crocuses, and early tulips, hyacinths, narcissus and other bulbs, and plant them in November, while the best time to get picotees, pinks, clove carnations, wall-flowers, sweet Williams, Canterbury-bells, rockets, and any of the biennials would be August and September. They will stand over the winter, and give flowers, although very inferior in size to the blooms in the country; in short, London, though not capable of competing with the country, will always sustain enough vegetation in its worst places to justify attempting a garden in a small way in preference to the usual wretched appearance of the square openings behind a house. Our squares, considering the opportunity, and generally speaking the expense, are very much neglected; the trees and shrubs ought to be periodically washed with an engine, and the ground should be well drained. A constant succession of flowers could be kept up without much cost, and there is no excuse for the present smoky and desolate appearance. There is too much fondness for deciduous plants, which makes a garden look wretched all the winter, and too little care taken of the evergreens when they are procured. It

is discreditable, that you cannot touch a shrub without blacking the hand, and we recommend the gardeners who now have the care, to at all events keep the plants clean by washing. It should be remembered that the rain only washes the upper surface, whereas the garden engine well applied, with a rose on the branch, to scatter the water small, would force off the dirt from the undersides and the stems. Again—the rain, to which alone the task of cleaning is now left, is often too gentle to remove it, and comes at intervals too far apart, so that, in fact, the gardener's business should be to wash them effectually and often. But in any attempt to make or improve a London garden, evergreens should predominate, and it will soon be seen which succeeds the best, for such ought to be the ones encouraged. In recommending people to buy young plants in autumn, and half grown annuals in spring, in preference to raising them in London, we are looking at the nuisance of a hot-bed in a small place, and at the advantage of starting with good healthy plants; and in condemning the people who are constantly crying out that nothing will grow in their gardens, we are just fancying how much they do towards making them. They buy roots at a market with hard lumps of clay round them, which dry like a brick. They stick this in a hole, as nearly upright as they can, and drown it once with water; the poor drooping things perhaps never hold up their heads any more, or, if they do, it is to open two or three flower buds while they are wet, and to die in the attempt. If you must buy plants at market, go early, look out those whose roots have not been compressed (for they are useless), and plant them out the instant you can get them home. There are some who send roots merely lifted out of the ground into a basket, and in that state sold—there are hopes of these, if they are not too forward, but they are never any use if they are in bloom; sometimes they will live if they show buds, but they are better if they do not; and pansies, wallflowers, and twenty other things that are brought in full bloom, are only flowers of a day, as it were, and get worse every hour from the moment they are purchased, and would, if they were taken back to the very ground they came from.

#### ON THE PROPAGATION OF PLANTS.

BY JAMES HERIOT.

PLANTS are propagated in various ways, upon each of which it may be of use to make a few remarks. Where the plants are native, or where the temperature is not much below that of their native place, the seeds will ripen; and, of course, they can be increased in this way.

Annual plants which perfect their growth during the summer, and die in autumn, or on the approach of winter, seem in this respect to ripen their seeds under circumstances which perennial plants, that is, plants which last for several years, will not do so. Many annual plants, originally the natives of warmer climates, are found when properly attended, to ripen their seeds in the open air in this country, and this is found to be still more the case on the continent, where the summers are warmer than they are in this country, and thus, although the average of the annual temperature may be nearly the same, yet, as their growth and ripening is completed before the commencement of winter, it has no effect in retarding the ripening of the seeds, where the seeds are hardly ripened upon the plants, yet, by cutting off the stems, and putting them under a frame, the seeds will continue to ripen sufficiently to grow, but, of course, can hardly be so much depended on as when fully ripened on the plant.

It seems unnecessary for me to give directions for the sowing of the seeds of various kinds, as they will vary somewhat according to the plants. Annual seeds, particularly annual flower seeds, may be sown either in spring or in autumn—those sown at the former period are intended for the ornament of the flower garden during the summer—those sown in autumn, in the months of August or September, are intended to be planted out, and to flower in the month of April or May. The spring sowing may be either in pots, from which they can be transplanted into the open garden on the arrival of spring, having been somewhat previously hardened, or they may be sown in the open ground. There are some advantages attending each mode of management, as they can be sown in pots, and kept in a frame or the greenhouse, and will thus be nearly as soon in flower as those sown in the preceding autumn. The annuals sown in the open border will be sown about the middle of April, the beginning of May, these, of course, are somewhat later, but from not being removed, grow to be much stronger and finer plants and flower well in the end of summer.

Where annuals are sown in autumn, as above-mentioned, many of them will be found hardly enough to bear the severest frosts of winter, but where this is not the case, they can be put under a frame, so as to be protected from the severest weather during the winter, attending, that if they are kept in a frame, air must be given them at all times when the weather is moderate; when this is the case, they can be planted out in the open border early in the spring, where they will

flower sometime before those which are sown in the open border.

We shall now proceed to consider the sowing of the seeds of biennial and perennial plants. These in general do not flower the same season, and may be sown either in spring or in autumn. Where they are not protected, it may probably be as well to sow them as soon as all danger of frost is over, that is, about the beginning of May; they will thus grow strong plants before winter, and will therefore suffer no injury. When sown in pots they may be sown in the month of September, but, as in this case they will not be strong enough to stand the frost of winter, they had better be protected in some way, either by being put into a frame, or into a pit, so as they may be covered either with mats or branches of the spruce fir, which will prevent the frost from being so severely felt. In the spring they must be hardened, by gradually removing the coverings, and then soon afterwards be planted out where they are to remain. A little bottom heat at first will make the seeds come away more freely, and where it can be easily procured, should be always given. In general, the newer the seed is, the more rapidly it grows, and therefore a person has great advantages where he can grow his own seed; and this applies more particularly to the seeds of the finest flowers, such as carnations, pinks, and auriculas, as much of the purchased seeds, the sellers are apt to mix their new seeds with any old seed of the same kind left on hand from the preceding year.

Having thus concluded what it may be necessary to be known regarding raising plants from seeds, I shall proceed to consider the other modes of increasing the number of plants by other methods; and with regard to herbaceous plants, they are most commonly increased by dividing the plants in winter or spring, before the plants begin to grow, and are in a dormant state. Bulbous plants generally throw out small bulbs, which may be removed after they are grown to a tolerable size—of this, the tulip may be adduced as an instance; these young bulbs, after acquiring some size, are taken off the parent bulb, and are planted in rows, in a bed by themselves, and when they acquire strength, they come into flower in a year or two after being taken off.

The woody plants are most commonly increased by cuttings, but the consideration of this mode is too extensive to be entered on at present.

#### GROWING CLIMBERS AS BUSHES.

To produce in any climbing or rambling plant a dwarfness, symmetry, and branching cha-

racter, no method can be so effective as pruning, provided always that the plant be susceptible of amelioration by such means.

To prune a Climber or a straggling plant of any description into a low and compact state, it is indispensable that the operation be begun early. As a shoot can only be trained nicely in a given position, by a due and *timely* attention to securing it in that position, so, more peculiarly, a plant can alone be made to assume a particular shape by commencing the means of giving it that shape while it is yet very young, and before it has taken another form. Pruning should therefore be resorted to upon the first or leading shoot, and at the end of its first year's growth.

But early pruning will be of no use in such a case, unless it be vigorously continued. Prune frequently, must be as much the cultivator's motto, as *prune soon*. The latter is necessary to educe lateral shoots, in sufficient abundance, and sufficiently near the base of the plant. Yet the former must be adhered to, as the sole way of multiplying the number of those lateral shoots, and relieving that degree of dwarfness which may have been commenced. Nor should this subsequent pruning be confined to the winter season. In reference to tender exotics, it should be repeated several times in the same summer, where the plants will admit of its being done; and even the hardiest species, whose shoots are at all disposed to ramble, may have those shoots stopped once or even twice in the progress of their growth.

Prune closely, is still another maxim which must be strictly enjoined. Early pruning and repeated pruning will be of comparatively little value, without hard pruning. The shoots—at least where the operation is a winter one, and during the two or three first years of the plant's advancement—should be cut down to within two or three inches of the old wood, as their nature may demand or justify; for it is solely by this close reduction that the desired compactness and profusion of laterals can be realized.

That the shoots should be pruned down to a bud or eye—that a sharp knife should be used for the purpose in all cases—and that where the branches are small and tender, or the laterals scanty, or the growth exceedingly luxuriant, greater rigour should be exercised in the process—are directions which may just be alluded to, and of which all will perceive and appreciate the propriety.

A second manner in which dwarfness may be ensured or assisted, is by greatly cramping the roots of the plants. The old Chinese fashion will furnish an idea of this. Miniature trees, of eighteen inches or two feet in height,

can be obtained by this mode; and, consequently, tall-growing plants must necessarily be capable of a similar reduction in height and other dimensions. The practice must, however, be carried to a very great extent, and will be of only little use unless accompanied by the employment of a poor soil. With this auxiliary, it may be adopted in a few instances with success.

For realizing, however, the true and best advantages which this practice is calculated to impart, it should be combined with that of pruning; for, by itself, it will certainly effect the object to a greater or less degree, but it will do so at the expense of the inflorescence. Not that it will diminish the quantity of the latter; it will only lessen its size. When united with pruning, and not pursued to an extreme, it will be highly beneficial.

Nevertheless, when we speak of confining the roots of plants, we are not to be understood according to the common sense of the phrase. As generally employed, it means that the diameter of the pots in which they are usually grown should be small; whereas, we intend that those pots should be peculiarly *shallow*. By this means, additional fertility will be gained, while a check will be given to the plant's growth at the same time.

The last method we shall notice for inducing dwarfness, refers almost exclusively to Climbers. It is by layering their shoots all around the parent stem, and rearing thus a thicket of small independent plants, which, though they will have roots of their own, will also, by retaining their connection with the old stock, remain dwarf and flower beautifully. By selecting appropriate subjects for this treatment, and giving the benefit of pruning in addition, very noble bushes might be obtained for the shrubbery borders or flower-beds.

This plan is, moreover, adapted for some kinds of tall shrubs, or for usually dwarf objects, that have from any cause become straggling. We have seen evergreens, such as Rhododendrons and Laurels, immensely improved by it.

Were we, in closing this article to supply a list of those plants to which we think our remarks most fitly apply, we should have to fill two or three pages with a catalogue, which, after all, would be necessarily incomplete; and which any one may make out for themselves from the general characteristics we intend furnishing.

Climbers, of nearly every class, hardy, greenhouse, and stove, might be most aptly treated in the manner we have sketched; and either or all of the three modes of operation pointed out applied to them, as their character may warrant. Of hardy ones, we may name, as



illustrations, several species of *Clematis*, Honey-suckle, Jasmine, and *Wistaria sinensis*; while *Thumbergias*, *Poivrea coccinea*, *Tecoma grandiflora*, various *Jasmines*, and probably *Stephanotis floribunda*, and *Allamanda cathartica*, may be ranked among the more tender kinds.

Of shrubs that are straggling, or apt to become so, and may be rendered closer by either of the methods proposed, besides *Rhododendrons* and *Laurels*, we may single out *Cydonia japonica*, *Roses*, *Spericus*, *Lilacs*, *Guelder Roses*, *Syringas*, &c., which may be kept almost as small as desired; with *Horea Celsii*, *Euphorbia splendens*, *Rondeletia odorata*, and a vast quantity of other exotics, both stove and greenhouse.

Let it not be thought we give these as even the most striking examples. They are selected at random; and we may affirm that there are few plants of a like character which might not be rendered particularly interesting by the treatment we have described.

We have thus given the principal part of Mr. Paxton's article on this subject from the Magazine of Botany for March, but although it will apply to plants which may be better called tall plants than climbing, it cannot answer for any true climbing species; look at *Tropæolum* which is both thread-like and succulent, and forms nothing like wood; or let those who are not familiar with such plants look to the common convolvulus or scarlet bean which are similar to many very fine climbers, and the utter hopelessness of an attempt to make them bushes will strike everybody. In fact, such operations as are recommended, would only do for plants which form wood, and which, however rambling in habit, flower upon short joints. Many plants so treated would never flower, for then the flower bearing branches would run further than could be any how tolerated in branches of dwarf trees or shrubs, and although it may do for some it is impossible to adopt it to many others. The only way to make Climbing Plants dwarf is to use that kind of trellis which will allow of winding them backwards and forwards, so as really to dispose of their length. With regard to plants which make hard wood much may be done.

#### THE EARLY FRIENDS OF THE HORTICULTURAL SOCIETY.

THE thankless public are too often unmindful of those efforts, to which alone they are indebted for many benefits; and it is no uncommon thing to find them turning round upon men to whom they owe extensive obligations. Nine cases out of ten, the founder or early friend of an establishment is visited with infi-

nately more severity than a total stranger would be in his place, and one error is enough to sweep away a life of faithful service. We do not remember an instance in which this was so cruelly manifested as in the case of Mr. Sabine, whose death was noticed at the annual meeting of the Royal Society, and by His Royal Highness the Duke of Sussex, who deeply felt the justice of our charge against the public, and thus alluded to the services and treatment of the deceased botanist:—

“Mr. Joseph Sabine was educated in the University of Dublin, and devoted himself from a very early period of life to the study of botany, ornithology, and other branches of natural history, to the neglect of those professional studies which his friends designed him to pursue. One of his earliest labours was the formation of a collection of British birds, of almost unrivalled extent and completeness. He became secretary to the Horticultural Society at the period of its first establishment; and though his connection was afterwards very abruptly, and perhaps very harshly, terminated, he must always be considered as the chief author of its successful and complete development. To the Horticultural Transactions he contributed sixty-four papers, the most important of which are those on the genera, *Crocus*, *Dahlia*, and *Chrysanthemum*; and he was also required to rewrite the greatest part of the communications which were addressed to the Society by gardeners and practical men, which were rarely sent in a fit state for publication, but which frequently embodied very important information on the various processes of horticulture.

Mr. Sabine was likewise an active and valuable member of the Zoological Society, whose gardens are chiefly indebted to his taste and knowledge for the introduction and systematic arrangement of those splendid flowers and shrubs which have added so greatly to their beauty and interest.

#### GARDENERS' GRIEVANCES.

I have seen at different times articles of a page or two of your most extensive, laudable, and valuable work, occupied in laying before the public an account of the inadequate remuneration of the journeyman gardener, and arguments used to draw the attention of the friends of that science to the subject, and to stimulate them to exert themselves to render that way-worn traveller in some degree comfortable, to soften his calamity, and to provide a balm to heal his bleeding bosom of distress, so that the evening of the world may not always be cloudy and tempestuous to him, whose industry, patience, and content in adversity are worthy of imitation. And I have frequently

been grieved to hear persons who should know better say twelve shillings per week is ample remuneration for the journeyman gardener. Is it not shameful?—does it not argue a want of all due consideration? But why, I ask, with a degree of indignation—why are they entitled only to a mere subsistence; are they worse members of civil society than other men? Are they worse members of religious society than all others? This, no man in his sober senses will dare to avow. Why, then, I ask again, have they a right only to a mere subsistence? I should like to know from what premises do persons who talk in this manner draw their conclusions? Not from the principles of common equity and justice, *which, with Scripture, says that the "industrious labourer is worthy of his hire."* It is evident then, that the premises from which they infer that the journeyman gardener is entitled only to a mere subsistence, exist nowhere but in gross ignorance, or in, what is worse, base ingratitude and want of affection to their fellow beings. But this year we stand upon an eminence; and, like the traveller who has attained the summit of a mountain, we not only look back on the ground we have passed, but forward to the prospect which now lies before us. And proud am I to see the same manly and liberal spirit of enquiry which has enlightened every other branch of knowledge, begin to find its way into the *science of gardening*; and the establishment of a national botanic garden is just what is wanted in a country like this, possessing so many resources, and occupying one of the most commanding positions on the globe, it cannot but exercise a powerful influence on the minds of all enthusiasts in their attachment to that *science*. So far I rejoice, that in the proper spirit they commenced at the Regent's Park Gardens, by giving the most humble man on the premises fourteen shillings per week, and others much more.

A. S.

#### COLLECTIONS AND RECOLLECTIONS.

**SOOT.**—The most stimulating manure that ever came under my own observation for parsley, is soot. It should be sown thinly all over it in showery or rainy weather, in order that it may be washed in. If sown on a dry day, I find the principal stimulating properties pass off at night by the dampness of dew and mist, and are thus lost in the atmosphere. I prefer sowing the soot very thin, twice or three times, to sowing it thick at once. By the above treatment, I have parsley of the most luxuriant healthy growth; the leaves or branches very large, of the most beautiful dark green and curliness; handsome for garnishing

and good for all purposes. Soot is not only a wonderful stimulating manure, applied to plants with caution and judgment when they are sufficiently strong; but it has also another good quality, that of killing and expelling any kind of vermin with which the plant should happen to be infested. Likewise, if the canker make its appearance, nothing that I could ever find will so completely eradicate it as soot and slacked lime, mixed together in equal quantities, and sown over the plants. In a few days they will be completely clear of it, very much altered in colour, and improved in growth.—J. BARNES, *Bicton*.

**ALSINE.**—Alsine, or chickweed, affords a remarkable instance of the *sleep of plants*; for every night the leaves approach in pairs, so as to include within their upper surfaces the tender rudiments of the new shoots; and the uppermost pair but one at the end of the stalk are furnished with longer leaf stalks than the others, so that they can close upon the terminating pair and protect the end of the branch.

**A MIRACULOUS APPLE TREE.**—In the 385th number of the Philosophical Transactions of the Royal Society, Mr. Dudley gives an account of an apple tree which annually bore a very considerable quantity of fruit, though it had never a single blossom, nor anything like a blossom upon it. In the course of his observations, he states that he daily examined the tree till he annually saw the young apples begin to appear on it; which he did, he says, in plenty, at the time that the other trees which had borne flowers produced theirs, and that the apples ripened upon it like those upon the other trees. He also adds, that though he had observed this apple tree only for three years, there were several persons in the neighbourhood who assured him that it had gone on in the same way for forty years, bearing fruit regularly every year, but never producing any flower.

**FROST UPON FRUIT TREES.**—*Probatum est.*—At the particular season of the year, when the young blossoms of wall fruit and standard fruit trees are liable to be cut off by what is commonly denominated white or hoar frost, perhaps the following French method of protecting trees from such injury, may prove acceptable to some of your numerous readers:—If a thick rope be intermixed among the branches of a fruit tree in blossom, the end of which is directed downward so as to terminate in a pail of water, should a slight frost take place during the night, it will not in the smallest degree affect the tree, while the surface of the water in the pail which receives the rope will be covered with thin ice, though the water placed in another pail by the side of it, by way of experiment, may not, from the slight-

ness of the frost, have any ice on it at all.—Yours, *Utile et Dulci*.

**VINEYARDS.**—Sir Thomas Harmer, one of the court of King Charles I., gives this account of the management of his vineyard at Blackheath. The soil he described as extremely barren, being composed of light white sand mixed with stones. The vineyard was from one to two acres, and the vines were planted in shallow trenches, about two yards asunder, with a path between, admitting of sufficient passage to prune them. The grapes produced were the Muscadine, Fontignac, and common black ones, though no account is given of the wines that were made.

**BRAN AS A DECOY FOR SNAILS.**—I have

tried it, and found it quite effectual. I had been much annoyed, and my plants had suffered much by them, and I could not find any remedy but that of examining the plants *separately* and frequently, which was very tedious; but by laying small patches of bran in the vacant squares of cauliflower, lettuce, and other beds of vegetables, I find snails, a small black worm, which I believe is the germ of the black snail, and many other insects congregated there, and have seldom found *any* on my plants since. If the patches of bran be covered so as to keep it dry, it seems to be more attractive to the vermin, and that is easily done by broken flower-pots, pieces of slate, &c.

## GLENNY'S GARDEN PRACTICE.

### KITCHEN GARDEN.—APRIL.

**HOT BEDS** for various purposes should be made up if required, and old ones of which the heat is declining if in use for Cucumbers, should be lined as before directed, for which purpose stable dung should be kept ready. If you have not begun Cucumbers yet, you may sow seed in pots, so also you may Melons, if you intend having them early, and put the pots in any of the beds already in work. Cucumbers already out, only require laying their branches evenly over the beds, and taking off the tops beyond the second joint when young. Do not trouble yourself about impregnation, at all events let them take their chance, instead of pursuing the old plan of conducting the farina of the male blossoms, indeed we should take them off altogether. Do not let more fruit perfect themselves than you require, especially if you are showing, for in that case, you should not let more than one fruit on a branch remain to grow, and let that be a promising one, many will only allow one fruit on a plant, this may be going to the other extreme; giving the plants air daily by tilting up the back of the light is indispensable, and so also is the covering up at night. In preparing the hot-beds for planting, or as it is called ridging out the Cucumber plants, a heap of loam should be placed in the centre of the hot-bed, and the ball of earth should be turned out whole and placed in the heap, or a sort of basin at the top of the heap: as the roots make their appearance through the sides of the heap, the loam should be drawn down a little and more added, until the bed is level or nearly so, when a good fruit appears it should be secured from the dirt beneath it, by placing a flat board or piece of slate or tile under it, or if for show a sort of long box in which it

can be straightened if inclined to grow crooked. They require occasional refreshing with water, which should be placed in the hot-bed in its vessel, until it is the same temperature as the air and soil of the bed. Take off all damaged leaves, and any that turn yellow.

**LETTUCES.**—Repeat the sowing of lettuces of all sorts, and plant out any that you have large enough, let the ground be rich and light, the plants a foot apart.

**SALADS.**—Sow also Corn-salad, Mustard, Rape, Cress, Salad Raddish, &c., as before.

**RADDISHES,** both short topped and the turnip rooted, when you have any already up, thin them early, water in dry weather.

**KIDNEY BEANS.**—Plant a few in drills two feet apart, and the beans three inches apart in the rows.

**SPINACH.**—Sow either broad cast or in drills, but the latter is the cleanest mode of cultivation. The drills may be eighteen inches apart, and the seed sown very thinly in them. This spring Spinach is generally pulled as soon as it is large enough to cook. If sown broad cast, they must be thinned to nine inches apart, and if they are allowed to grow large enough to allow the thinnings to make a dish, there is no great harm. As soon as it has four leaves the hoe ought to be used to thin it out to three inches or it cannot grow well; then in a few days three plants out of the four all over the bed may be taken up for use, continue sowing every fortnight.

**BET ROOT.**—If not sown already as directed last month, ought to be got in directly.

**GARLICK AND CHALLOTS.**—Plant the first week, the smallest bulbs will greatly increase

in size, and large ones will increase in numbers, throwing offsets in considerable number. It is the custom among those who grow for stock to plant them earlier, but in private families the quantity planted is often rather dependent on the unused remainder, and small. It is not uncommon to return to the ground at once all the smallest offsets on digging up the stock in autumn; if this has been done it may be sufficient without planting more.

**LARGE ROOTED PARSLEY** is used for those purposes which require great strength of flavour and do not require the leaf, the root itself being used. A small quantity may be sown.

**POTATOES.**—The main crops of early may be planted in the middle and the late at the end of the month, remembering that a row under a good hedge, paling, or wall, with a southern aspect, will be some days a-head of any other, besides being more easily protected if they are up very quickly. Many ways of planting the Potatoe might be mentioned, deep drills and the earth drawn over them, planting every other ridge where the ground is so left, first laying on them some dung, and then drawing the earth down, ploughing furrows and having people follow to drop them, and allowing the plough to cover them with another furrow, or a man to draw the earth down upon them, are all practised: but perhaps the most general, though by no means the best, is dibbing holes and dropping in the sets; but any way which allows them loose earth to lie on, and loose earth to cover them, is preferable to the dibber, which of course hardens the ground all round them by the pressure. The Dwarf sorts of Potatoe may be planted in rows about two feet apart, and at distances of fifteen to eighteen inches in the row; the large and taller growers require three feet from row to row, and yield all the better crop for having plenty of room. I prefer whole sets to cut sets, and Potatoes too small for market, will do for the purpose; in fact, I have had as good a crop as was ever desired, from sets picked out of the chats usually given to pigs, and never had a failure from disease.

**JERUSALEM ARTICHOKE**s should be planted this month, and it is quite a mistake to plant them in a bad situation, for they come smaller and worse when not allowed room; the sets should be small whole tubers, and two feet apart in the row, four feet from row to row. Although they will grow in any corner, and can scarcely be got rid of when once in the ground, they are never fine unless they have abundance of room, for the plant grows six feet high.

**CABBAGES**—Plant out any of the plants

remaining of those kept through the winter in nursery or seed beds, that is, if you are likely to want them, and have ground to spare. The Cabbage is a valuable vegetable to fall back upon at all times when others are scarce, and it is eatable from the time it has six or eight leaves, until it has hearted, and been cut, and then its sprouts gathered young are even more tender than the Cabbage itself. Sow a little more seed, and prick out in rows a foot apart, and plant three or four inches apart in the rows, in good rich ground, to gain strength, those which are large enough of the seedlings sown a few weeks since.

**SAVOYS.**—Prick out in nursery beds, the same as Cabbages, to grow strong before permanently planting out.

**KALE OR BORECOLE.**—Sow this month some of the curled and variegated sorts, for there is no better winter green in hard weather. This vegetable has many names, such as—Browncole, Greencole, Ragged Jack, Scotch Kale, &c.,—and there are many different varieties of curl and colour in the leaves and habit, but they are all good, and especially the variegated. Sow in a patch to plant or prick out from.

**BRUSSELS SPROUTS**, also a fine and a very handsome vegetable, may be sown now.

**CAULIFLOWERS** under hand-glasses should be earthed up close to the stems, and nearly as high up as the lower leaves. Water them regularly, and take off the glasses in mild, warm weather. Plant out all the plants that may remain of those that have been kept over the winter.

**BROCCOLI.**—Sow at the beginning and at the end of the month the sorts which are best adapted to your wants, or you may use three or four sorts.

**ONIONS.**—Sow more if you are likely to want them, and have a rich piece of ground in an open situation ready for them, but the principal crop should have been sown last month. This crop soon requires hoeing, not less to clear it of weeds than to thin it out. Those sowed last month, if they are up and doing well, will soon require thinning, and the best way is to go over them, and take out the surplus carefully, for they will do to plant out, or to eat very small. When the crop is gone over the last time, they ought not to be more than six inches apart.

**CELERY.**—Plant out any that you have large enough from the January sowing, in trenches, six or eight inches deep, fork the bottom of the trench a good spade deep, mixing a quantity of well rotted dung in with the soil, plant them in this well worked bottom nine inches apart—this will grow large enough to use quite as soon as it is required, though much depen-

dence must not be placed on it. Prick out the strongest of the February and March sowings as soon as they are large enough to handle well; let the ground be well dug and dunged for it, and plant them three or four inches apart, and continue this pricking out from time to time as they grow larger in the seed beds, so that as each season of sowing and pricking out, gets large enough, they may be planted in trenches for their regular growth.

**CARROTS AND PARSNIPS.**—Sow in drills or broad cast, first taking care that the earth is trenched a spit and a half deep, and well broken to pieces, then it must be levelled, and the drills drawn a foot apart for drill sowing, and the seed sown thinly along them, and covered with the rake very evenly, and not deep. If sown broad cast, the seed must be scattered thinly all over. Any that have been sown, and come up, must be weeded, and thinned to not less than four to six inches apart. When sown in drills, the crops may be kept clean much easier than when spread all over the ground.

**POT HERBS,** if not done before, may be planted in slips, or parted to make new beds, and such of them as they raise from seed should be sown, if not already done.

**BEANS AND PEAS.**—Continue to sow a few at a time, at equal distances of time, and in the same way as previously recommended.

**CAPSICUMS, TOMATOS, AND CHILLIES.**—Pot off one or more in a pot, according to the size. A sixty or forty-eight size holding one, a thirty-two size will take two, and a twenty-four size three; these must be still kept in a hot-bed, for the Tomatos will not bear planting out till the middle or end of May, and that should be against a south bank or wall. The Capsicums and Chillies must be grown in the house or hot-bed to ripen well.

**TURNIPS** may be sown rather liberally the middle of this month for the principal crop. Dig, dress, and level the ground, and sow the seed thinly, rake it well in, and if you have a roller, let it be used—if not, the seed should be trodden into the ground before the last raking.

**VEGETABLE MARROW.**—This is now grown of all shapes and sizes, but there are some more favourite than others. The great fault in the gourds brought to market is that they are allowed to grow too large. They ought to be gathered before the seed increases in size, this, however, is soon discovered by cooking several ages. The seeds should be sown in a hot-bed, and potted off till May, and then covered with a hand-glass when first planted out.

**THE ORDINARY OPERATIONS** of hoeing, thinning, earthing up, keeping the edges of the beds and the walks in order. Peas, Beans,

Cabbages, Cauliflowers, Spinach, all suggest the necessity of these matters being continued as a matter of course; and as a general rule, almost without exception, whatever some of our modern theorists say to the contrary, and whether natural or unnatural, every thing thrives better for loosening the top surface of the ground, and nothing tends more to annoy and destroy vermin.

#### FRUIT GARDEN.

**PLANTING** fruit trees should never be delayed to this time from choice, where it has been neglected, or been impracticable, or in short omitted from any cause, not an hour should be lost; turn back to our autumn and winter instructions for directions how to conduct the operation. Be exceedingly careful that the roots be not damaged in the taking up, cut off every ragged or jagged end where it has been bruised, and thin out the head of the tree by removing every branch that can well be spared consistent with the beauty of the plant, and even shorten any that are remarkably strong or straggling. Then keep the tree out of ground as short a time as possible, and have it very firmly fixed in its place by stakes.

**PRUNING** should have been done long since according to previous directions, but upon the plea of "better late than never" do what may have been left undone; this applies to the management of Fruit Trees, and Bushes, Raspberry canes, Vines, and all fruit bearing trees, shrubs, and bushes.

**VINES.**—The cuttings of Vines and layers will still root, but it is later than they ought to be deferred.

**GOOSEBERRY AND CURRANT** bushes may be still pruned, and their cuttings still struck to propagate the sorts, but it is late.

**FRUIT ON WALLS, VINES, &c.**—Upon the weather this month much of the labour depends, sometimes scarcely a bud is to be seen, at other times there are actual shoots. It will be enough here then to say, that as soon as you can see which shoots will be useless on wall trees and Vines, rub them off to give strength to those which remain, for if a bud can be dispensed with, it is better rubbed off at once. In Vines especially, every shoot draws a large share of nourishment from the plant, and no wood shoots, (that is to say shoots without fruit,) but those wanting for bearing wood the next year, should remain on, in wall-fruit trees, all shoots that point outwards should be stopped at once, for they never can be useful.

**GRAFTING** like all other violent operations should have been done long since, but may yet succeed. Those which have been grafted

should be examined to see if they are all correct and fast, and properly covered by the cement or wax, and at the joints.

**NEWLY BUDDED TREES**, that is to say, those budded at Midsummer should be examined, and if any portion of the stock exhibits growth it must be immediately rubbed off, that the entire strength should go to the new bud.

**INSECTS** must be industriously sought and destroyed: there is nothing more effectual for this purpose than a syringe engine well applied with a small rose to divide the stream into numerous parts almost as small as a thick thread; this worked hard upwards between the wall and the branches, and afterwards in front, so as to apply some force will completely wash off almost every description of pest from the trees and out of the crevices of the walls also, and if there be nothing in the borders a sprinkling of salt and water along the foot of the wall will settle the affairs of almost every thing, and prevent their ever opening a fresh account; to slugs, snails, and caterpillars its effect is instantaneous, and very few things are anxious for a second trial, earwigs should be trapped by laying bean stalks along the bottom of the wall and blowing them into a pot of salt and water every morning; one caught now is better than fifty in fruit season.

**STRAWBERRIES**.—Take off the runners as fast as they come, unless you want new plants, in which case leave a few of the strongest only; clear the beds from weeds, loosen the earth on the surface, and if the weather prove very dry, water liberally, not merely the plants but the whole beds.

Other matters in the fruit garden require the attention recommended in past months.

#### FLOWER GARDEN.

**ANNUALS** of the kind that require to be raised in frames with hot dung should now be sown for the entire garden, and the best way perhaps is to make a dung-bed on purpose if possible; put three or four inches of light rich earth on the dung, and a garden frame and light upon it, make drills with your finger three or four inches apart, and sow the annuals in rows in such lengths as will give you the quantity required, placing carefully a label with a number corresponding with the name of the seed in a list: give air and water occasionally until the plants are large enough to pot off, or plant out, as the case may be. Those which were sowed last month or the month before for the purpose of growing in pots should be potted off, and the pots changed from time to time as the roots fill them up. Balsams, Cockscombs, Tricolors, and other

plants depend for their beauty upon these judicious changes, plenty of heat, and air, and light, for they cannot be too near the glass though they should be shaded during the burning heat of the sun. The annuals which afford the greatest variety and novelty are the following:—

#### CHOICE ANNUALS.

\* *Campanula Lorei*—hardy, blue flower, plant one foot high, blooms abundantly in June, July, and August.

\* *Clarkia Pulchella*, *Alba* and *Grandiflora*—hardy, shades of rose and white flowers in the form of a cross, eighteen inches high, and blooms July and August.

\* *Clintonia Pulchella*—half hardy, beautiful three coloured flower, plant one foot high, and blooms in July and August.

\* *Collinsia Bicolor*, *Grandiflora*, *Heterophylla* and *Verna*—very showy, hardy, various colours, flowers abundantly in a sort of spike during July and August. The predominating colors blue, black, white, and rose.

\* *Collomia Coccinia*—hardy, plant a foot high, flower scarlet, blooms July and August.

\* *Erysimum Peroffskianum*—hardy, plant grows eighteen inches high, blooms bright yellow, June, July, and August.

\* *Gilia Tricolor*, and *Tennifolia*—hardy, three coloured and rose, plant grows eighteen inches high, and blooms abundantly, July and August.

\* *Godetia* (*Oenothera*) mixed—hardy, great diversity of colours, flowers large and rather cupped, plant grows very dwarf, and the varieties flower June, July, and August.

\* *Ipomoea Nil*, *Purpurea*, *Grandiflora*, and *Picta*—half hardy climber, convolvulus flower, blue and purple, and blooms July, August, and September.

\* *Caliospis* mixed—beautiful half hardy, branching plant, with bright yellow and brown, and other coloured flowers in profusion, grows two feet high, and blooms July, August, and September.

\* *Leptosiphon*, *Densiflorus*, *Androsacous* and *Albus*—hardy, plant grows six inches to a foot high, purple, blue and white, blooms June, July and August.

\* *Lobelia*, *Gracilis* et *Alba*—hardy, flowers blue and white, plant grows one foot high, and blooms July, August and September.

\* *Lupinus Nanus*,—hardy, dark blue, handsome, but small; dark blue Lupin not higher than a foot, and blooms July, August, and September.

\* *Lupinus Bicolor*—hardy, purple and blue, plant grows one foot, and flowers July, August, and September.

*Lupinus* in varieties come of all colours

and heights. *Cruikshanksii*, is perhaps the most showy, growing three feet high, and blooming with a very gay diversity of colours July, August, and September.

*Mesembrianthemum*, *Tricolor*—half hardy, three coloured flower, plant grows a foot high, and blooms July, August, and September.

\* *Nemophylla*, mixed—dwarf hardy plant, less than a foot high, beautiful bright small convolvulus-like flowers, blue, white, spotted, and different shades, blooms July and August.

*Nolana Prostrata*—a trailing plant bearing a blue convolvulus-like flower of about the same size, violet colour, close to the ground, blooms July and August.

*Rhodanthe Manglesia*—half hardy, delicate habit, crisp lasting starry flower of rose colour, plant growing not more than a foot or eighteen inches high, blooms July and August.

\* *Phlox Drummondii*—beautiful half hardy dwarf *Phlox*, a variety of colours, and pretty habit, flowers growing in bunches like a *Sweet William*, there is a scarlet variety, blooms July, August, and September.

*Schizanthus*, mixed—a branching, half hardy plant, with small irregular-formed flowers of various colours, blooming July and August, and growing from twelve to eighteen inches high.

*Zinnia*, mixed—a showy, half hardy, round flower, of the aster form, but with blunt petals forming almost a close circle, colours vary from white to lilac and dark purple, and from pale rose to deep crimson and scarlet, height of plant two feet, blooms July, August, and September.

\* *China-aster*, \* *Balsam*, \* *French Marigold*, *Cockscomb*, *Egg plant*, *Ice plant*, with the still more common \* *Larkspur*, *Candy-turf*, \* *Sweet Peas*, \* *Mignonette*, \* *Ten Week Stocks*, \* are a sort of standard favourites which novelty does not drive from the field, and of many of them the varieties now are so splendid and numerous, that with a small garden one hardly knows where to stop, for a packet would serve half a dozen amateurs. However it is worth any one's notice to read a seedsman's catalogue, for it would show some wonderful novelties even among old tribes of flowers. It is not the season yet to sow perennials, but when the time comes there will not be wanting lists of the best. As very few people will buy all the seeds I have enumerated, I have put a star to such as I should decidedly buy for their beauty, or perfume, or both.

PERENNIAL AND BIENNIAL SEEDS I consider may be bought a month hence, but if you have not already for your borders the principal ones, endeavour to procure a few

plants for this year, and sow yourself for next. Those necessary for your beds and borders are, *Wallflowers*, *Sweet Williams*, *Columbines*, *Canterbury-bells*, (both the common and the chimney *Campanula*), *Polyanthuses*, *Scarlet Lychness*, *Pansies*, *Stocks*, *Hollyhocks*, &c. all desirable. The last for the backs of the borders or among the shrubs, and all the middling and dwarf plants for the conspicuous parts of the garden. If there were only two or three of each of these they all deserve a place. *Hollyhocks* are becoming deservedly a favourite from their great improvement in form and colour.

THE BORDERS AND BEDS now exhibit their contents above ground, and you can see where there is room for a plant and where there is not; fork them over without disturbing any thing, and where you have room either place the plants I have mentioned, or sow patches of those seeds best adapted, according to the colour, height and habits of the plants already there, calculating as well as you can what the plants will be that you are putting there, or what the seed will produce.

GRAVEL WALKS should be all turned, and if there be not gravel enough to make them look well add some more. Box edging should be repaired, grass lawn mowed, and all the departments cleaned and kept so.

DAHLIAS.—The forwardest of the struck plants must be topped if they get too tall, and struck if numbers be wanted, and a constant succession of cuttings must be continued to be taken from the tubers, and struck as before; but in propagating, regard must be had to the quantity wanted, for it is no use to go on striking beyond the number required for growth and pot stock. Those intended to be grown in pots should be shifted from time to time as the pots fill with roots. All that are sufficiently grown should be put into a cold frame or pit, to harden for planting or sending out next month, but it must be remembered that even in this cold frame or pit the frost must not reach them, so that unless there are means to shut out frost most completely, they had better remain drawing up in the frames, only remove them to the coolest. If any bed is declining in heat, it would be right to shift all that were well struck and nearly large enough, into it, as the safer and better place to gradually harden them. The tubers which you propose to merely part, without striking any cuttings, and those which have yielded all the cuttings you require, may be parted into as many pieces as there are good eyes, or as many only as are required, in which latter case, the eyes (excepting the one you intend to form the plant) should be rubbed off, but all tubers which do not sufficiently show the

eyes, may be thrown into a hot bed without potting. A day or two will make every eye start. It is a frequent practice among those who grow largely, to start the eyes of all their remaining tubers this month, cut them into as many pieces as they will conveniently make, with at least one good eye each, to pot such as are required to be forwarded in heat, and plant the remainder out as if they were so many potatoes, covering them a few inches above the crowns. These are planted if required for bloom, the same distance as other plants, but if they are merely for stock they may be placed much closer. The ordinary distance for blooming plants is six feet every way, but they will do at four feet by six, and if they are only required for stock, two feet by four is sufficient distance, or even less, but there should always be room to get among them to examine if they are correct to their names, as nothing is so perplexing as to have mistakes in this particular. Avoid putting any unstruck cuttings into beds, whose heat is declining; there is every probability of their failing to strike in any reasonable time, and some chance of their failing altogether. If such be the state of your beds, and you have no new ones, take away as much of the spent litter as you can all round, and replace with a lining of fresh hot stable manure; it will soon re-instate the proper heat. But I have given in former months the method of newly lining hot beds.

**TULIPS.**—Stir the earth all over the bed an inch deep. One of the most handy tools for this purpose is made with the blade of an old dinner knife, made red hot in the fire, and an inch of it bent down like a small hoe. While stirring examine any that seem faulty, by carefully going down to the root if necessary, and if any part of the foliage looks cankered cut it clear away with a sharp knife, for it is certain death if left, therefore the whole plant might as well be killed cutting it away, as have the smallest particle left, for it will spread and destroy it. Cover up more than ever from frost and heavy falls. They should have no rain but such mild showers as will not run the surface together again. All Tulips should be carefully preserved from sun and wind, and, in the event of a frost occurring severe enough to touch the foliage, which, in spite of ordinary precaution will sometimes happen, it is good to water them all over, and cover up directly, in an hour the frost will be all out, and the plants none the worse. Should the frost continue during the morning, the mats must not be removed until it is gone, for the sun must not touch them until the frost is all out.

Roses may be checked in their bloom by removal; but the better way to throw them

later, for succession of bloom, is not to cut them back, until all the upper buds have shot half an inch, or an inch. The lower buds will not have come forward; and by cutting down, as we have before described, to one or two lower eyes, they will be a fortnight or three weeks later than those cut a month ago.

**CARNATIONS AND PICCOTEES.**—The stuff having been all prepared last month, pot off the stock in pots of number twelve or number eight—the former will hold a pair, the latter will occasionally hold three, but one pair in good health will fill a good sized pot with their increase; and, were it not for the convenience of layering the side shoots for the next year's stock, less pots would do. There are many nostrums recommended for Carnations, but there is one substance for which the roots have such a liking, that we should be very much inclined to try it on a small scale. We allude to pitch. The sticks that are dipped in pitch to preserve them from rotting, are so completely enveloped in roots, that they cannot be withdrawn without dragging the stocks up by their roots, while the sticks which do not undergo this operation have not a root near them; from this I gather, that pitch is acceptable to the plant, and think a few sherds or crocks dipped into pitch, and mixed with the bottom layer of earth, would be worth trying; it can do no harm. The operation of potting is simple enough. Provide yourself with plenty of broken pots, and let them reach as near as possible one-third of the distance up the depth of the pot. When the pots are thus far provided with drainage, have your heap of mould as handy to your potting bench as possible, and your crocks at the bottom should be laid shallowest in the centre, and rising on the side, forming a hollow almost like a saucer; then put sufficient of the compost, which should be chopped small, but not sifted, to form a cone in the middle of the pot. By tapping the edge of the small pot in which your plants have been wintered upon the edge of the potting bench, plant downwards, but secured by your fingers crossing the surface of the mould in which they are growing, the ball will come out entire; throw away the loose draining crocks from the bottom of the ball, take away some of the surface soil, but not enough to damage a single fibre, then, holding the ball with both hands, lower it on the cone, which will give way with the slightest pressing, till the collar of the plants are even with the top edge of the large pot, or a shade below it; fill the vacancy between the ball and the side of the pot with the soil, knocking the bottom of the large pot gently on the bench to shake it down, and pressing the mould round it moderately close, but not hard,



with a stick. They may then be set where they are to bloom, or for the first few days, if you can, in a sheltered place, and the work is done. They might with advantage be placed in an open shed, or any situation where they might be protected a little from the inclemency of the weather, should any heavy fall of rain or frosts come on. You must be careful, too, in examining all the soil, that you may be able to say with some confidence that no wire worm is among it, for one pest of this kind is quite capable of spoiling your best new pair of plants, just as a single earwig can spoil your best bloom. It is a common practice to make a stage to hold the large pots the instant they have the plants in them—the supporters of this stage should be in pans of water, and some are made on purpose; but tall, thirty-two sized pots standing in shallow pans of water, rims upwards, and boards upon them, form as good and as safe a stage as any. The water is no security against the attacks of earwigs which fly, but it does keep off the hundreds which would find their way into the pots by crawling up, if the water did not prevent them. With regard to the precise time of potting, I have always potted as early in the month as the weather would allow, but if it were boisterous and unsettled, and I had no good dry sheltered place to keep them, I should be inclined to defer it to the middle. The very best stuff I ever used for Carnations was from a heap of rotted turfs which had been cut thick from a rich loamy meadow, and I used two parts of it to one of dung rotted into mould.

**CARNATIONS** to buy, **SCARLET BIZARRES**.—Bucknall's Earl Fitzhardinge, Coleut's Brutus, Headley's Achilles, Martin's Splendid, Smith's Duke of Wellington, Strong's Duke of York, Twitchet's Don John. **CRIMSON BIZARRES**.—Ely's Lord Milton, Ely's Duke of Bedford, Jacques' Georgiana, Mansley's Robert Burns, Puxley's Prince Albert. **PINK AND PURPLE BIZARRES**.—Sealey's Princess Royal, Strong's Linnæus. **PURPLE FLAKES**.—Ely's Mango, Mansley's Beauty of Woodhouse, Mansley's Bonny Bess, Martin's President, Millwood's Premier, Strong's Esther, Willmer's Solander. **SCARLET FLAKES**.—Addenbrook's Lydia, Bucknall's Ulysses, Chadwick's Brilliant, Mitchell's Patriot, Wilson's William the Fourth, Willmer's Hero of Middlesex. **ROSE AND PINK FLAKES**.—Brook's Flora's Garland, Ely's Lady Gardiner, Ely's Lady Ely, Greasley's Village Maid, Iron's Queen Victoria, Lowe's Marchioness of Westminster.

**RED-EDGED PICCOTEES**.—Barraud's Cornelius, Brinklow's Masterpiece, Giddin's Teazer, Sharp's Duke of Wellington, Sharp's Red Rover, Wildman's Isabella, Headley's Sarah, Sharp's Gem, Sharp's Hector. **PURPLE EDGED**

**PICCOTEES**.—Dickson's Trip to Cambridge, true variety, Ely's Field Marshal, Headley's Nannette, Kirtland's Princess Augusta of Cambridge, Mansley's Nulli Secundus, Sharpe's Invincible, Brinklow's Purple Perfection, Brinklow's Lady Chesterfield, Ely's Mrs. Fenton, Gidden's Vespasian, John's Prince Albert. **ROSE AND SCARLET PICCOTEES**.—Green's Queen Victoria, Kirtland's Mr. Annesley, Willmer's Princess Royal, Barnard's Mrs. Barnard, Barraud's Bride, Dickson's Bride, Garratt's Lady Dacre, Wain's Queen Victoria. **YELLOW PICCOTEE**.—Barraud's Euphemia, the best yellow out.

**PINKS**.—Make up your Pink beds if they were not made in autumn, by mixing together the loam from the top spit of a meadow, or rotted thick cut turfs, and half the quantity of decayed cow-dung, and let the bed be a good foot thick of this mixture, and well drained, or if your ground is pretty good and will grow good vegetables, simply mix a good six inches of decayed cow dung into eight or nine inches, this part of the bed as it is, but there is nothing so good as fresh loam from a heap which has been formed of thick turfs or top-spit taken from a meadow. If the ground lays low let the bed be made up a good six inches above the path, if on the contrary it lays high and dry, remove by digging out, quite as much stuff as you put in, and the surface will then be only like the other beds and no higher, except that a little must be allowed for sinking. If you can get your Pinks taken up carefully without squeezing the roots together into a ball, which is much too usual a practice, and without breaking any of the fibres, you may plant them out six inches apart every way, but only have six rows, and the beds only three feet wide; this enables you to get well at them to disbud them, tie up the calyx, dress the flowers, take off pipeings, &c. without deranging the bed: between these beds there should be alleys of twelve inches wide, or if ground be no object fifteen will do better. The Pinks are then situated the first, three inches from the side, the second nine, the third fifteen, which is as far as people can reach conveniently to dress a flower; and foot marks ought above all things to be avoided on a flower bed frame, nothing is much worse than pressing the soil close. Let them be planted with a trowel without damaging the roots, and gently watered to settle the earth about them. As to the kinds to be purchased, the collections are large, and it will be difficult to select, but the following twenty-four would be found useful. Garratt's Queen of Roses, Keyne's Colonel Baker, Brown's Model, Hodge's Melona, Dry's Earl of Uxbridge, Norman's Defiance,

Aker's Lord Brougham, Collis's Majestic, Unsworth Dunga, Norman's Henry Creed, Creed's President, Garrett's Alpha, Cousin's Little Wonder, Wilmer's Duchess of Kent, Leg's Prince Albert, Weedon's Queen Victoria, Wilmer's Prince of Wales, White's Warden, Smith's Dr. Coke, Bunkhill's Queen Victoria, Church's Romana, alias Rosianna, Wilmer's Queen Victoria, Hodge's Gem, Holmes's Coronation. Not but there are others equally as good as some of them, but these are a good beginning, no time should be lost.

**POLYANTHUSES.**—Loosen the earth in the beds, and give a top dressing of decayed cowdung or leaf mould, or a mixture of both, and when the rain runs it together and closes the pores of it as it were, stir it again, so as to mix it a little with the soil itself, but be careful to disturb not the fibres. Those in pots should be treated in the same way, the top surface being first actually removed down to the fibres, and the whole should be examined. Procure if you have not got them, Maud's Beauty of England, Nicholson's Bang Europe, Peerson's Alexander, Buck's George the Fourth, Cranshaw's Invincible, Cox's Prince Regent, Bernard's Formosa, Gibson's Royal Sovereign, Collier's Princess Royal, Clegg's Lord Crew, Cheshire Favourite, Clegg's Lord John Russell, Fletcher's Defiance; and if you have none, these are a good beginning, take off the smallest if more than one head of bloom is rising.

**HYACINTHS** and other bulbs in patches or in beds should part of this month be protected with hoops and mats, or which is better, transparent waterproof canvass or calico. It is a great mistake to suppose the blooms do not suffer in character, even those of the most hardy plants.

**AURICULAS.**—The blooms of these plants are now rising fast, and they must be protected against wind and falls of any kind, as well as from dust; this latter is difficult in some situations. Those who take great pains for exhibition will form a square place with temporary fences, to keep off wind, and temporary hedges or shades of some kind, to keep off the sun, and as soon as the blooms begin to open place a table or stage so as to be screened from the north and east wind; on this table place half a dozen pots within the space to be covered with a full sized hand-glass (nine can be placed, but six is better), place four forty-eight sized pots, wrong side upwards, at the corners, to hold up the glass that height from the table or stage, thus giving air underneath, but protecting the blooms. These must be shaded by something thin and close, such as canvas, for matting is not so good. This may be hung on the sunny side of the glass, it takes away but little light, but keeps off all the

burning heat. This place being provided for as many hand-glasses as you are likely to fill. Take the mildest part of the day to remove any that are forward enough; they ought to be grown a good deal towards the size of their flowers. Let them be placed under the glasses in their blooming quarters, and so placed that you can get at all of them, or any one of them, when you please. Now take them one at a time from under the glass, cut out those pips which are of no service, either from being too forward or too backward, and place the others so as not to be in each other's way in opening, this is done by generally inclining the foot-stalks one way or the other, and if they will not of themselves lay well, place soft moss or cotton wool between them, so that they may be held in their places, and have good room to open out well. Any check from cold or wet while opening would spoil the bloom; so, indeed, it would from the time they begin to show their pips; this is the reason why last month and the present are the most competent in the year. The plants as they are thus adjusted must be returned under the hand-glasses, and at night, they should be carefully covered up with warm clothing of some kind; but perhaps the very best thing is waterproof light canvas; this must have heavy weights on the sides and ends to keep it close down to the table, because, as the under part of the glass would otherwise let in the cold, it can only be kept out by the cover being kept down close. Every day the opening blooms should be examined, and their positions regulated, with a view to their forming a handsome truss. This part being well managed saves enormous trouble on the day of show, when many a fine flower neglected in this particular gets spoiled in endeavours to place the truss well, after having grown its own way. Those who bloom only for a stage of flowers may continue to bloom them in the common frame, taking care to shade them in the heat of the day, and cover warm at night, then, as soon as one pip is fairly open, the plant is removed to the stage. An Auricula stage is formed like a box with the lid open, and propped up, forming a shelter to those in front, there are shelves inside, like those in a greenhouse, sloping from the bottom in front to the top at the back. But I prefer showing them, even to company, under hand-glasses, forming by means of boards a flat table, one foot from the ground, and placing the plants under hand-glasses, well cleaned, choosing a situation rather shady and pleasant, and in blustering weather covering the entire over with a waterproof canvas, as thin as I can get it; nevertheless, a handsome stage well filled is a beautiful sight.



### THE GARDENERS' SKETCH-BOOK.

THE above is one of many subjects that have been forwarded to us from the sketch-book of a travelling gardener, who suggests, also, that his brother gardeners would derive both amusement and advantage from following his example, viz., of making a rough sketch of any subject or effect that is at all striking, just sufficient to remind him of it again.

Now we can conceive the possibility of a very poor draftsman doing a thing well enough to remind himself of a particular scene, whether it be an opening which showed a distant view, an old stump of a tree, a remarkable specimen of timber, a rock, cottage, hill, wa-

terfall, windmill, or any other object which had a striking effect from its situation. From the scraps forwarded to us we have selected about half a dozen, which may give a notion occasionally to persons on large domains, where, by throwing down some trees, they may open a view to more interesting specimens or objects. The sketch before us has a pleasing effect, chiefly for the specimen of decaying oak, which, as well as fifty other objects that might be found on large estates, would be worth throwing open by the destruction of a few less interesting subjects, and be made to form a distinguishing feature at some given point.

### THE PEACH-TREE IN AMERICA.

THE Peach is *Icosandria Monogynia*, and can be worked on the wild and domestic plum, cherry, and almond. It is supposed that the Peach is produced, by culture, from the hard-shell wild almond. So far as relates to the stock, the domestic plum appears to suit the graft or bud. The writer has tried the wild-plum stock—the trees in the instance referred to did not grow thriftily. He has young Peach-trees worked on cherry-stocks, apparently doing well, the Peach part is of no unusual appearance.

In considering our subject, we start with this fact, that from the earliest tradition, we hear of the Peach in New York, Connecticut, New Jersey, Pennsylvania, and the adjoining localities. About 1812 or 1815, the trees be-

gan to decline, and have continued to decline, until they may now be said to be extinct, as bearers, in at least some of the referred-to localities. In its former state of healthful growth, it was to be seen in the richest grounds; in all soils and situations; occasionally taking an accidental position, amid thorns and briars on the side of the blind walls of some neglected farm; and sometimes in the tough sod of the highway. They grew as food for man and for swine,—neither were stinted.

A full-grown healthful Peach planted in America, in the fall, grows four feet high its first year, with a smooth, bright yellow bark, and green foliage. The second year it grows well also, and the only thing to be discovered is a small worm (called in popular language

the Peach-grub) at its root, about an inch below the surface of the ground. The wound made by the grub is hardly perceptible, but its presence is traced by a small quantity of gum, coloured red by the gimlet-like borings of the insect. The grub, if neglected, the third year will have girdled about one quarter of the bark of the tree; but the tree will not show, in its leaves, any disease—on the contrary, it will blossom and produce a dozen or more of good Peaches. The fourth year the grubs continue their borings of the tree, perhaps one third of the bark near the surface of the earth is girdled; but the tree is slightly affected; the leaves in May and June become red and blistered, and curl up, and some of them *collapse*; yet the tree will not be injured externally, so as to destroy the fruit, though many of the leaves will show a light *yellowness*—in fact, a good crop may be taken this year from the tree. The fifth year, the grub, if neglected, still continues to girdle the tree, and in particular places, one half the bark is destroyed; but this appears only to wound, not poison the tree, for in instances where the worm has been destroyed, and the dead bark removed, the trees soon recovered from these *mechanical* injuries. This (fifth) year, the leaves of the tree become *all yellow*, and one half the fruit, of which there will be a great quantity, will ripen prematurely and fall: some few will remain on the tree and become passable. But the tree dies of the *yellow*s, not of the grub. It appears to the writer that the disease of the Peach-tree is *sui generis*, and has no connection with the injury produced by the grub; no other fruit-tree that the writer knows of, dies in the same manner, or at least with the same appearance. With other trees, the injury is mostly, if not altogether, externally obvious: the curled and blistered leaves appear peculiar to the *yellow*s, at least among the garden-fruit. Mr. Cox, in his most valuable treatise, though an old one, describes the *yellow*s as the malady which destroys much the largest portion of the Peach-trees, and that it has hitherto baffled every effort to prevent it.

As far as the writer knows, no tree in the United States, or elsewhere, has become so universally fruitless and short-lived. The doctrine is no longer believed in England, that all the grafts of particular kinds of fruit have died, so we cannot account for the disease of the Peach on any similar principle. Our summer and fall pears do well, though the vergalooze, and some other varieties, have for several years have failed, yet they appear to be recovering; but of Peaches *all* may be said to have failed in this locality.

It must be one of the causes enumerated below, which produced the disease in question.

*First.* Some sickly tree must have been imported, or some deleterious locality must have produced the disease called *yellow*s, (I know of no better name,) and by its contagious qualities, disseminated itself throughout the country, like the small-pox, and other contagious diseases. Some sensible nurserymen, in the State of New York, would as soon have a case of yellow-fever in their nursery of children, as a tree infected with the *yellow*s in their nursery of trees. To be sure, nothing similar in the vegetable kingdom is known; in fact, the death and corruption of seed, and the decay and rottenness of the tree, are the food of their progeny. But if this doctrine be the true one, we may have some relief in quarantine laws and sanitary regulations as to the transportation of trees. Trees and plants might be smoked, as, in some countries, they smoke letters!

Gentlemen who believe in *contagion*, recommend immediate removal and destruction of the diseased tree.—Now this ought not to be objected to—for a new tree can be so easily procured—except that this plan abandons all idea of a remedy. They should, at least, leave some of them to be subjected to experiment. We dismiss the above position, and call upon its advocates for the reasons of their belief.

*Second.* The next possible cause of this disease, we enumerate the climate, including change of weather, warmth, rain and drought, frosts and easterly winds. Many intelligent persons attribute the disease of the Peach to one or more of the causes above mentioned. In confirmation of this might be quoted the European opinion, that frost has at several different periods killed the sycamore, and it is said in the United States, that the American sycamore was killed in 1841 by frost; and well-informed persons think this tree since 1841 has continued to be affected, especially in the State of New York, by frost.

Now I enumerate the following reasons as conclusive, in my mind, against the theory that frost has anything to do with the *yellow*s, or the general declension of the Peach.

Our climate has not changed, but it is the same as it was when the Peach produced abundantly. Neither tables, nor tradition, represent any material alteration; to frost we have always been subject. The Peach is not a tender tree. The October cling-stone is frequently in fine health, and with fruit on, long after the frost, when all the potatoes, all the melons, peppers, beans, &c., are cut off. The apricot and nectarine, which come forward and bloom before the Peach, grow well in the gardens in our cities, and in the country, when well protected, and give abundance of fruit. Now if frost was the evil, these trees, particularly those

protected, coming out first, and liable to the same *frosts* as the Peach, should blister up and die with the yellows.

In an account of the spring of 1836 on the Continent, in one of the British magazines, the loss of the crop of grapes, pears, apples, &c., from an untimely frost, is mentioned, but it states that the *Peach-trees* never looked finer.

Again, is it reasonable to say that although for a hundred years the Peach-tree bore without being affected by frost, yet for the last thirty years there has regularly been a frost each year sufficient to destroy the Peach-fruit, and kill the tree? The state of the atmosphere, easterly winds, &c., are all about the same as when the Peach-tree was in perfection, no material change is alleged by anybody. We therefore dismiss all these doctrines, and adopt the only rational one in our judgment; that the *yellows* in Peach-trees is produced by insects. To prove our position, we shall mainly refer to written authority of the most valuable character.

Mr. Keen, the great English gardener says, that "in 1834, when the blossom-buds of his Peach-trees were as large as hemp-seed, a solution of lime, sulphur, and soot, was thrown on his trees, and not a single blistered leaf was to be seen." Now it is believed that the blister of the leaves is an invariable precursor of the *yellows*. The soot and sulphur would not keep off frost.

The American Orchardist, a Boston work, represents the curculio (the grub-worm) as the great enemy of the Peach. The author says, "he never saw the *yellows* in New England." Now, New England is less subject, from the cold, to insects, and more liable to injury from frost, and yet according to this authority, there is no *yellows* there. New York, and the states adjacent, may have produced insects unknown in New England, —though the writer believes that the *yellows* is in New England, and the insects producing it, too. The statements hereafter, although they tally (and on that account this article has been written) with the experience of the writer, yet the main facts and opinions expressed are from the most modern European and American authorities.

The aphides, or plant-lice, are the enemy which produce the *yellows*, and destroys the Peach-tree. This family of insects embraces a great variety. The apple-louse, the cabbage-louse, rose-louse, and willow-louse, of popular designation, for they are best named, for our purpose, by the particular tree or plant selected as their domicile. These different kinds of lice subsist, sometimes on the roots, particularly the cabbage, and among flowers, on

the roots of the asters, but on the Peach they attack the leaves, bark, and tender twigs. The apple-louse commences at the surface of the ground, attacking the different parts of the tree.

Curtis, in an excellent article in the Journal of the Royal Horticultural Society, remarks, that there is no tribe of insects so universally distributed, or exceeding in multitudes the plant-lice; that probably there is not a plant from the smallest grass, to the most stately tree, that is altogether exempt from this pigmy. Linnæus considered every plant supported a distinct species of louse, and some plants are attacked by three or four species of lice—they multiply beyond all calculation. From an egg, in one season, 729 millions are supposed to be created. They make their appearance so quickly and in such myriads, as to be termed a blight, and their numerous appearance directly after a thunder-storm, has led to the vulgar supposition that they come from the clouds.

Professor Harris says, "These insects are one of the causes, if not the *only cause*, of the peculiar malady affecting the Peach-tree in the early part of summer, called the *blight*," which is no doubt the yellows of New York. Reamer, a French author, observed the ground quite moist under Peach-trees infested with bark-lice, which was caused by the dripping of the sap from the punctures made by the insects. These little insects are most easily examined on the rose-bush. The varieties are very numerous. In the green-house, two or three weeks will produce a generation, and one parent, in one season, will produce several millions. The authority above referred to, states that eggs are laid by the winged-lice in the fall on the trees, and that they hatch in the spring only females without wings, and that *these females*, without the presence of the males, give birth to several generations! (not produced by eggs.) But the male being winged, and the two modes of creation being at variance with nature, the writer thinks the statement in the latter particular, doubtful. The facts, however, show how numerous these insects are, many of which cannot be seen with the naked eye. These lice have a proboscis with which they perforate the tender bark and leaves, and suck up the sap, which they exude in great abundance by *two vents*, which exudation is called honey-water, which the ants devour so greedily, that the lice have been called the milch-cows of the ants, who even rub them down, being good farmers, to make them increase the quantity of honey-water.

It is not only the quantity of sap they take, but they poison and corrode the remainder, thus

stopping up the pores of the bark, and making the tree send out shoots in unusual places, and of an unhealthy character. One who has felt the bite of a musquito, or has been stung by an hornet, or seen the like or similar insects madden the horse, or considers that a cow, by her milk, will feed a dozen children, but dies in sustaining a quarter of an ounce of vermin, will readily suppose a tree would be killed by the parasitical attacks of fly.

#### MR. WARD'S CASES FOR PLANTS.

It has struck us that the following account of Mr. Ward's Cases, which appeared in that beautiful work called the *Botanist*, would be acceptable at a time when people are anxious to know the construction, and understand the principles upon which Mr. Ward professed to grow plants in them.

Many may have heard of the method of growing plants adopted by this gentleman, but as it is at once interesting as it regards the physiology of plants, and important as regards their transmission from one part of the world to another, and their subsequent cultivation, we here introduce some account of it, partly from the letter of Mr. Ward, addressed to Sir J. W. Hooker, and published in the *Companion to the Botanical Magazine*, vol. i., p. 317, and partly from our own observation; having been furnished by Mr. Ward, not only with an opportunity of having the drawing made, but also most politely with every facility of judging of his plan in full operation.

The structure of the Cases vary slightly, according as they are intended for ornament in a house, or for the transmission of plants by sea. The glass in those intended for voyages, must be covered with a wire grating to protect it, as any fracture would be destructive to the plants within; and it should be lashed to the poop of the vessel, exposed to the light, and not interfered with during the voyage. In this way Messrs. Loddiges have sent out, or received, not fewer than 200 cases, and generally with complete success.

For ornamental purposes in houses, the Cases should be constructed as follows:—A frame or pedestal with castors is to be made, nearly the width of the window where it is to be placed, and so high that the portion of the Case consisting of glass shall be on a level with the window, so as to ensure the free exposure of the plants to the light. A Case formed of wood is then to be placed on the support or pedestal. This wooden Case may be about a foot and a half deep, and of similar width. It must be coated internally with pitch, or any cement which will keep the humid earth from being in contact with the wood. A hole is to be retained

in the under side of the box, perforating both the pitch and the wood. This box is to receive the mould, which, after the plants are planted therein, is to be saturated with moisture, and the superfluous portion allowed to drain off by the hole just mentioned, which is afterwards to be closed with a wooden moveable peg. The wooden portion of the Case is to be surmounted, to the height of two or three feet, with a framework of bronze to receive the glass, and the form of the upper part is to be similar to the roof of a house, the central beam of bronze having a number of hooks attached to it, by which succulent plants, such as *cacti*, may be suspended, with or without pots. There is a small door of glass on the side remote from the window, through which the plants are introduced. The closer this door fits, and the fewer times it is opened, the more successful will be the result. It neither is, nor is intended to be, perfectly air-tight; the whole being glazed as a greenhouse. That glass answers best which is termed flatted crown glass. The plants which require much humidity are to be planted in the soil of the box, those which need less may be suspended, in pots, containing sand, from the roof of the case. Plants which vegetate in very warm climates, and exogenous plants generally should be placed at a window facing the south. Ferns, and similar plants, do well enough before one with a northern exposure.

The prime causes of the difficulty of growing plants in large cities are excessive evaporation to which they are subjected in pots, and the deleterious effects which the products of combustion, disseminated in the atmosphere, produce upon them. But by this ingenious plan these obstacles are removed, and plants have grown in some of Mr. Ward's Cases, *flowered and ripened fruit, without receiving a fresh supply of water for several years*. Its utility, in facilitating the transmission of plants from remote regions, has been abundantly proved, and its value becomes obvious when the difficulties formerly experienced are considered. The beneficial results likely to follow a more extended adoption of this plan cannot be estimated at present, but even already the number of new plants thus introduced into our stoves testify its importance. Nor is it possible to estimate too highly the effects which it will have in increasing the pleasures and enjoyments of the inhabitants of towns, by enabling them to adorn their rooms with the most beautiful and tender plants. It is not necessary to build a fine or expensive Case, such as that above described, to carry it into practice: *a large wide-mouth bottle, with a proper quantity of moist earth, closed with a portion of bladder or thin India-rubber, will answer well, and in such have we seen a beautiful specimen of Chorozema cordatum*.



growing in Mr. Ward's house. Thus the poorest as well as wealthiest denizens of our cities may gratify their taste for flowers, and have their care repaid more thoroughly than it ever was before. Cowper, who, 'mid a faithless generation, was found faithful to the love of nature, has observed that the relish for the beautiful works of the Creator :—

— Is a flame that dies not even there,  
Where nothing feeds it. neither business, crowds,  
Nor habits of luxurious city-life,  
Whatever else they smother of true worth  
In human bosoms, quench it or abate  
Even in the stifling bosom of the town  
A garden, in which nothing thrives, has charms  
That soothe the rich possessor; much consoled,  
That here and there some sprigs of mournful mint,  
Of night shade, or valerian, grace the wall  
He cultivates. These serve him with a hint  
That nature lives; that sight-refreshing green  
Is still the livery she delights to wear,  
Though sickly samples of the exuberant whole.  
What are the casements lined with creeping herbs,  
The prouder sashes fronted with a range  
Of orange, myrtle, or the fragrant weed,  
The Frenchman's darling? Are they not all proofs  
That man, immured in cities, still retains  
This inborn, inextinguishable thirst  
Of rural scenes, compensating his loss  
By supplemental shifts, the best he may?  
The most unfurnished with the means of life,  
And they that never pass their brick-wall bounds  
To range the fields, and treat their lungs with air,  
Yet feel the burning instinct: over-head  
Suspend their crazy boxes, planted thick,  
And duly watered. There the pitcher stands,  
A fragment, and the spoutless teapot, there;  
Sad witnesses how close pent man regrets  
The country, with what ardour he contrives  
A peep at nature, when he can no more.

*Cowper's Task, Book iv.*

Thanks to Mr. Ward, these sorry contrivances are quite superseded, and by his more elegant mode he may be truly said to have so far brought back the golden age, that he was succeeded in giving the year "eternal spring."

A similar plan was adopted about ten years ago, by A. A. Abercrombie, Esq., Advocate, Edinburgh, and with the same happy results. He, however, merely showed it to his friends; and to Mr. Ward, therefore, is due the praise of rendering the benefit a public one.

#### IPOMOPSIS ELEGANS.

BY JAMES HERIOT.

THE elegant *Ipomopsis* is a handsome plant of the natural order of the *polimonaideæ* of Lindley (the *pentandria monogynia* of Linneus). The plant is a biennial, and the seeds are sold by the nurserymen. I understand that this is a plant which is considered difficult to manage, and still more difficult to flower, it is seldom or never seen in flower, and is, I suspect, little

cultivated, but I think that a few simple directions will induce its more general cultivation.

I treated it as a tender annual, sowing the seeds in a light loam, having a mixture of leaf mould, and placed the pot in the vinery, the seeds came up rather thin, but sufficiently to afford me a few plants: these as they grew larger I potted singly in forty-eight sized pots, and it continued growing during the summer; on the approach of winter, they were placed on one of the high shelves of the greenhouse, where they got much light and were kept pretty dry, indeed I found that the greatest danger arose from their damping off. When the vinery began to be forced in the month of February, one of them was placed in it, and it very soon threw up its stems, and flowered very beautifully. If I remember right two plants were put out in their pots during the first summer, one of these damped off, the other perished from the wind breaking its stem after its having stood a considerable degree of frost without injury. I am satisfied that the great secret is to keep the plant dry by raising it in the centre of the pot, so that the water may not settle about the bottom of the stem and rot it; and I have little doubt that if this is attended to, it will be found tolerably hardy, particularly as regards frost, and the beauty of its scarlet flowers will amply repay any trouble which the gardener may have taken regarding it. If kept in a frame during the first winter it will probably flower in the open air in the course of the second summer.

#### ON PLANTING AND PRESERVING POTATOES.

DIG a bed of any length, four feet wide and a foot and a half deep; scatter moist manure over the whole, and place four sound Potatoes of a middle size across the bed, in rows two feet apart; whole Potatoes are better than sets, as the toughness of their rinds, and their substance, secure them from the dry and wet rot, and from insects.

Earth taken from the alleys should then be spread as fine as possible on the bed to the depth of three inches only; more earth to the depth of three inches must be added after a heavy fall of rain, to secure the moisture; if this second covering be given just as the plants are breaking ground, it will protect them greatly for a time, and strengthen the roots in case of frost; and radishes may be sown thereon to come off in due time, or after the plants are four or five inches high; the ground must be spitted to the depth of two inches only, that the roots may not be injured, and the earth may be spread evenly between the rows, and rendered

as fine as possible with the spade: this flat earthing to receive the rain must be preferable to the usual banking-up system, as that diverts the rain from the roots, and leaves some of them uncovered. Or, to save labour, the whole six inches of covering may be given at once at the planting of the first crop of Dwarf Potatoes in the open ground. The bed may be a little higher at the sides and ends than in the centre, that not a drop of rain may fall off. When the blossom buds appear, the stems bearing them have grown to their full length, they should therefore be cut down to within a foot and a half of the ground, to stop and force down the sap, and thus quicken the growth, and, consequently, the ripening of the young Potatoes; no other parts are to be removed, as they are raising sap for the benefit of the crop. The weeds should be Dutch-hoed once by a person standing in the alley, which loosening of the earth will cause the air and rain to reach the roots, and the sun to ripen the new Potatoes. Thus, if an over-dry season should succeed, the roots will receive sufficient moisture, the loose flat surface will imbibe every drop of rain, and give space for the growth of the young Potatoes. If an over-wet season follow, the alleys and the loose earth below the roots will receive and absorb the superfluous moisture.

Early Potatoes may be planted throughout the year, provided they are protected from the severity of the frost, harsh winds, and superfluous moisture: and this, it is presumed, may be accomplished by either of the following modes:—Let a moveable frame of any length, four feet wide, and having a cross board at each end—the back plank should be two feet nine inches, and the front one two feet wide, and the wood one and a half inches thick; dovetailed cross bars must be placed four feet apart in this main frame, to receive top frames four feet wide and four feet four inches long; the joints of all the frames must be ploughed and tongued together, as a security from the severity of the frost; ledges must be placed across the joints in the main frame, three feet apart, and well nailed. All the top frames should be closely boarded, and one inch in thickness; or let three pieces of wood or bars placed equi-distant be well mortised and tenoned together on the top frames, upon which the stoutest canvas should be strained and tacked, and thickly besmeared with tar-paint. Or, instead of the strained canvas, a thick thatching of reed or unthatched straw may be substituted. The frames must receive two or three coats of blue or dark green paint, to preserve the wood and to render the joints air-tight. The main frame can be quickly taken to pieces, and removed at pleasure. The top frames ought to be raised daily at every opportunity, and in a small degree at nights also,

when frost is not apprehended; and if they were wholly raised for ten minutes, during a heavy fall of snow, it might not be amiss. The earth between the planks ought to be well dug and manured before any sowing or planting takes place.

Four early Potatoes may be planted in November or December, in rows two feet apart, with their roots, if any have sprouted from their having been previously spread on a wooden or earthen floor, and covered with a damp woollen cloth, or from their having been placed in a damp cellar or other damp place secure from frost; earth taken from the alleys outside the planks must be spread evenly and loosely upon the bed to the depth of four inches only, and no earthing up is to take place: salmon-cloured radishes may then be sown to come off in due time. In April or May the produce will be thoroughly ripe, and may be wholly disposed of; for, if the roots are instantly planted in prepared ground close at hand, and well watered, they will strike immediately, and produce a crop in July or August for seed, which must be kept in the open air, upon hurdles or garden mats, or gravel walks, for three or four weeks, to harden; these roots may also be immediately planted and protected from the weather, but they must not be exposed to the air beyond a few minutes, or they will not strike. In April the top frames may be wholly removed into a shed or barn, to be protected from the scorching rays of the sun until Potatoe planting again: and should a frosty night intervene, the icicles must be removed from the Potatoe plants by brushing them with a heath, fern, rush, or other very light broom, or by forcing them off with a garden engine, or through the spout of a large watering-pot before the sun can dissolve them. The space within the main frame may be sown in compartments with the seeds of vegetables and flowers, and covered with a small meshed net, and occasionally with a cheese cloth, as a protection from the scorching rays of the sun until early Potatoe planting again. The Potatoes to succeed the first crop should be planted late in February or early in March, with their roots, which had been forced to sprout as before recommended; and those for the main crop in April, during showery weather, that they may be dug up when thoroughly ripe in October.

*Preserving Potatoes.*—Let Potatoes be dug up on a fine day, when thoroughly ripe and dry, and let the haulm or straw be placed on the highest part of the field or garden, on which the Potatoes are to be heaped, and let the heap be covered with dry straw, haulm, or refuse hay; a trench should then be dug round it, and the heap be covered with fine earth thrown on the hay or straw, which ought to be thatched



in such a manner that the droppings from the rain may fall into the trench. This mode must be preferable to pitting, which causes the dampness of the earth to rise, and, consequently, the premature sprouting of the Potatoes. The Potatoes should also be placed in three or more heaps in a field or garden, to prevent their overheating, which would take place if they were all formed into one heap. Or, if the Potatoes are to be preserved in a dry cellar or outhouse, it should be considered that stone or wooden walls not exposed to the sun or fire attract and retain dampness; and as moisture is transferable into icicles by the action of frost, so it is necessary to place dry sand, winnowed chaff, turf, mould, reed straw, or any other dry article, two feet thick, between the walls and the Potatoes, and also under the latter, should the floor be earthen or otherwise damp, and over the whole, as a protection from frost and dampness. It would also be proper to spread the dry saw-dust or any other dry article, between the layers of Potatoes, to absorb the moisture, and to fill up all crevices in the doors and windows in the outhouse, to cause the whole to be impervious to frost. The experiment may then be made of dipping with a cabbage net or small bag a few of those ripe and sound Potatoes into boiling water for one minute only, to deprive them of their sprouting qualities, and to keep them in a dry place secure from frost, to ascertain how long they would continue in a sound state for table use.

*Cooking Potatoes.*—They ought all to be of one size, and those rinds which are too bitter in a raw state for pigs to eat, had better be taken off, and whether they are cooked slowly over steam, or by boiling slowly in a small quantity of water, the water must be thrown away just before they are done; the Potatoes may then remain in the saucepan upon, or close to the fire, with the lid removed, and a coarse cloth substituted, for a few minutes, when they will be steamed dry; or they may be turned into a dish, and placed within the oven of a kitchen range, and salt may be thrown upon them during the process, to improve their flavour.

#### PREPARING, ARRANGING, AND PRESERVING HERBARIA.

SPECIMENS can be dried at any season of the year, provided they are free of wet or damp. It is requisite to dry every part of a plant—viz., root, stem, leaves, flowers, and seed. But that cannot easily be obtained of all plants; stem, leaves, and flower are the principal. When a plant is in full flower, about mid-day, full expanded, and free from all moisture, proceed to take your specimen off. I do not

approve of taking large specimens, as small ones do equally well, and are much neater. All Alpines, and the dwarfer sorts of herbaceous, I would take root, stem, leaves, and flower, selecting the smallest part that is furnished with the above properties. One side of the root I would cut off; and likewise, if the stem is more than an eighth part of an inch thick, I would split it longitudinally, to make it lie close on the paper; some of the leaves and flowers I would twist round, to show both sides, and more especially to show the calyx of the flower. Shrubs and trees, where roots cannot easily be obtained, I would take leaves and flowers, or a small branch, which would answer the purpose equally well. I would take the nearest representation of the general habit of the plant which could be obtained without injury. Some are dried betwixt flat stones, in sheets of paper, some in books, and others amongst boxes of heated sand, &c. Some plants require to be dried in an oven—such as aloes and staphelias; and a good many more of the succulents require this treatment. I consider the oven, when the collector can have access to it, is preferable to any other way of drying succulents. Have a press made of good durable wood, let it be two feet long, one foot broad, depth of each board two inches;—the boards to have a screw-bolt at each corner, and each bolt to have a nut with a handle fixed to it—it is better than a key. By this means the press can be opened in half the time, for two screws could be turned at the same time, one in each hand, &c. By having a half-inch board to fix betwixt the other two, the press could contain as many more. The best thing that I have found for drying them in is flannel. Blotting-paper I have found to do well with some of the more tender species. The reason that I prefer flannel is, because it sucks up the moisture of sap which they give out much quicker than paper. The flannel, before put in the press, should be well dried; then, after putting in one sheet of flannel, the specimens can be laid over it, taking care to have them all well opened out; then put another sheet of flannel on the top of them, put on the middle board, and proceed as before mentioned. Some of the more tender sorts require a sheet of silk paper betwixt them and the flannel, to keep them from adhering to it. After the press is full, screw it gently up—not too tight for the first twelve hours. After twelve hours it can be tightened up, and at the end of twenty-four hours they will be ready for turning. The flannel ought to be properly dried, and the specimens replaced as before. They will be ready for taking out at the end of forty-eight hours; if the press is kept in the sun or near a fire, they will be dry much quicker.

The collector must be provided with a book of cartridge-paper, with a leaf of blotting-paper between each, and a thickness of paper between all the leaves to make room for the specimens. The specimens should be classed and ordered; therefore the book should be divided into twenty-four parts for the twenty-four classes, and these classes divided in parts for the orders, and arrange them after the Linnaean system. The best thing I have found to fasten them down with is gum-arabic dissolved in water. With a small brush or the point of a feather wet the back of the specimen all over, then put it exactly on the place where it is to remain, and put a few small stones or any weighty thing over it, to keep it down till dry. The plants ought to be numbered, and have reference to the numbers in a catalogue arranged alphabetical at the latter end of the book. The specimens should be rubbed over with a little spirits of wine after pasted down; that makes them retain their colour much longer, and proves a good preservative from moulding, and the book ought to be kept in as dry, airy a place as possible. Likewise specimens of seed wood can be preserved in a case with a glass door amongst cotton. There are plants that will not keep the colour when dried; a drawing of them might be obtained and coloured according to nature.

To a botanist who studies the science with much attention, and with a view to becoming perfectly acquainted with it, neither books nor the most elaborate descriptions prove sufficient. He finds it indispensable to have within his reach some portion of as many species as he can procure. If he has access to any public gardens, a great many species may thus readily be obtained, although it is even at particular periods that he can study the flowers and fruit of any of them. A garden seldom or never contains more than a fourteenth of the number of known species, and more frequently not a twentieth. A collection of good specimens is invaluable to any botanist. But there is little encouragement for gardeners at the present time; there is little inducement for men to undertake herbariums. The wages in general are so small that it is almost impossible for men to appear respectable in society; and the books on gardening are so high, that the labouring gardeners cannot spare money to purchase them, without having recourse to some other means, except it is the GARDENERS' GAZETTE or some monthly magazines. I have further to mention, that the greater part of master gardeners will not allow their men to take specimens of any plant under their possession. That I consider to be the means of retarding any man wishing to persevere in such an undertaking. Men, however, who do undertake

such a task, should use discretion, and not touch plants that are new and valuable, but wait until they become general. I would by no means advise any one to take any specimen whereby it would be injurious to his employer. I shall be very glad to be informed of a better mode of drying herbaria than the one I have laid down.—A JOURNEYMAN GARDENER.

#### LISIANTHUS RUSSELIANUS.

As contemporary prints have been giving as almost a new discovery, directions for the cultivation of this showy plant, I hand you the following, which I have followed very successfully ever since 1839, and I confess it is a literal copy from the third volume of the *Gardener's Gazette*, which until the Gardener was established, was worth all the gardening works put together, but since you have transferred some of the most valuable papers to your pages, and I hope will take them all, the value of the early volume, will of course be lessened. It is quite clear that this paper on the culture of the *Lisianthus* was published at a period when even Mr. Paxton was unable to give any instructions on the subject.

"Amongst other valuable notes on florists' flowers that appear in the *Gardeners' Gazette* of March 9, I observe with pleasure one on *Lisianthus Russellianus*, from the able pen of Mr. Paxton; in one passage of which he says, So little has at present been ascertained respecting its cultivation, that we are unable to propose any routine with confidence. Now, Mr. Editor, it is the passage quoted that has induced me to take my humble pen, and to endeavour to explain the routine of cultivation that I have practised with complete success: and in doing so I will begin with the sowing of the seed, which I did on the first week of May, 1838; they nearly all vegetated by the end of May (it may be here observed that they were kept in a hot-bed at 70 degrees of heat), and were potted into thumb-pots by the beginning of July, and still kept in the hot-bed; in August they were shifted into 60-sized pots, after which they were allowed abundance of air, and harded, that they might stand the winter better. About the beginning of October they were removed to the airy shelf of a greenhouse, where they remained till the second week in January, when I took four of the strongest plants and placed them in a house used for forcing roses, and kept them at 50 degrees fire-heat; in ten days they began to grow a little, and, as the pots were full of roots, I then shifted them into 48-sized pots; the soil I use for them is, of light yellow loam one-half, of peat one-quarter, of leaf-mould one eighth, and of sharp sand

one-eighth; by the end of February they were ready for a second shift, when I put them into 32's, and to a day into 24's, in which I will have them in bloom by the end of May or beginning of June. From the above statement it will be seen, that, instead of two or three years, the plant can be flowered with ease in thirteen months from the sowing of the seed.

"One point in its culture is, never to give it a large shift at one, as the roots have a tendency to run direct to the sides of the pot, where, on turning out the ball, they may be seen hanging in a loose state; consequently the oftener it is shifted, and the smaller the shift, the more the roots get interwoven in the soil, and the more nourishment the plant will derive from them.

"*Lisianthus Russellianus* flowered for the first time in Britain at Bothwell Castle, in the summer of 1837; and in the autumn of the same year, at the Glasgow Botanic Garden: and to refute the statement of its being (as was at one time said) an annual or biennial, the plant that flowered at Bothwell Castle was raised from seed in 1835, flowered in 1837, cut down and the ball reduced out of a 16-size pot into a 32-sized, and wintered much in the same way as is practised with pelargoniums, watered in heat in the spring of 1838, and flowered to great perfection in summer, treated the same as before in autumn, and it has this season the appearance of being more splendid than ever, from the fact of its having numerous stems, all of which will bear five heads of bloom."

I have always fancied I knew the writer, but as he did not choose to publish his name of course I will not; all I know is, that I have seen prizes given season after season for specimens, which I have repeatedly surpassed, and I have done it by following these directions, entirely for I had not even seen the plant when I first read this.—A GARDENER.

#### PROPERTIES OF THE PEAR.

THERE is a difficulty in defining the properties of that which depends almost entirely upon fancy, but, there are some points which must be established to constitute perfection and these are:—

FIRST.—It must be highly flavoured, that is strongly flavoured, a quality opposed to watery or weak, and much higher than what is by way of praising called delicate.

SECOND.—It must be juicy and mellow and of that peculiar texture which melts in the mouth, when in the proper condition of ripeness.

THIRD.—It must possess the capacity of

keeping in perfection a considerable period, and the longer the better.

FOURTH.—The core must be small, the fruit large, and the texture close up to the core, the same as the main portion, and entirely free from roughness, and that lumpy or stony nature which is the characteristic of very many kinds.

With regard to the color and texture of the skin, there may be difference of opinion, there are those who prefer a smooth thick skin as being much the best calculated to keep the fruit perfect the longer time, and being the less susceptible of damage. If for instance the Gansel Bergamot had a thick skin, it would keep much longer in perfection, for it is so thin that the very slightest bruise destroys the pulp even almost before it is ripe. Then as to color, the Russet brown, or buff yellow, or any color but green, seems preferable to that color, not only because it is associated with the idea of the better sorts of Pear, but because green looks always unripe and cold. Then as to the form of a Pear, it would seem to look more natural a Pear shape as it is called, but round is in reality best on account of its having the greatest quantity of fruit in the smallest compass, and yielding a larger portion of the pulp all round the core. It will be observed, that the actual flavor is not even hinted at, for it is not easy to define; "highly aromatic" is the only attempted definition of a fine Pear, and this we take to mean what we have described as the first quality that is to say strength of flavor, a quality which over growth will deteriorate, as if the flavour were deluted by the quantity of pulp to which it had to impart its strength, thus the Charmontel of the finest growth and largest size is almost without exception the weakest in flavour, the Jersey fruit has this peculiarity, it is much more handsome and much worse flavoured than moderate sized fruit grown in England. But it is quite possible to have a Pear too sweet, that is sweet enough to detract from the peculiar flavour which is so acceptable in this fruit, and such is the character of many of the modern varieties, which though much more fine in appearance, taste in some instances almost like sugar and water, while others, less popular are superior in quality though not in size; however, much depends on the manner in which Pears are gathered and preserved for use, for a good fruit may be easily spoiled and a worse one be produced in fine condition to beat it: nevertheless taking all the kinds in perfection, they should possess the first four qualities to be any acquisition to the collection we already grow. Probably the best of the modern varieties is the Van Mons. Louis, le Clerc, first

let out by René, Longelier of Jersey, which we have eaten as grown in England, a very magnificent fruit.

#### ON THE CULTIVATION OF THE STRAWBERRY AS AN ANNUAL.

(Being part of a Lecture by Mr. Darke.)

MR. DARKE commenced by observing, that from the earliest writers on horticultural subjects to the present time, the habits of the Strawberry had never been examined minutely, with a view to improve its cultivation. It was true, that owing to the impulse lately given by Horticultural Societies to a study of the improvement in the varieties of this plant, several valuable kinds had been generated, yet of these scarcely one could be found that did not disappoint the expectations of the cultivator who adhered to the system hitherto adopted. In open, moist situations, where the soil was suitable, there was no difficulty in obtaining tolerable crops, provided sufficient space was allowed for the extension of the plants; but in the circumscribed limits generally allotted to gardens in the vicinity of large towns, and particularly in the small portion of ground usually attached to the dwellings of cottagers, the successful cultivation of this fruit was found very difficult. It was with a view to remove these difficulties, as far as possible, that he was led to adopt a series of experiments, which, he was happy to state, had been attended with the most successful results.

The lecturer, having described the general appearance of the plant from the time it was deposited in the bed till it arrived at maturity, observed, the portion of the plant which yielded fruit in the proper season was confined to the offsets or runners of the preceding year, and from thenceforth they were nearly barren. Having observed that runners ceased to be produced about the month of September, it followed that the principal part of the sap was deposited subsequent to that time; and since the produce of the following year wholly depended upon the deposition of a sufficient quantity to render the blossom buds productive, he concluded that if any means could be adopted to prolong the time naturally assigned for that purpose, in the same proportion would be insured a superior crop of fruit. The experiment he made was with the Downton Strawberry. As soon as the runners had produced roots about half an inch in length, and *previous to their penetrating the soil*, he cut off a quantity, leaving on each side of the runner about four inches of the sarmentum. Having prepared a nursery-bed by throwing out the soil to the depth of six inches, and trodden the

bottom very hard, to prevent the young fibres from penetrating, he then mixed the loose soil with a quantity of light half-decomposed stable manure, which he returned into the bed, raking the whole smoothly over, and dividing the surface into drills, six inches asunder and one inch deep. He then took the runner, and placing a finger upon each end of the sarmentum, he pressed it down in the form of an arch, the plant being on the top, and resting on the surface of the soil; the sarmentum thus held it firm, and, as appeared to him, materially forwarded its growth and strength, by supplying it with the moisture absorbed from the soil. When the whole bed was thus planted, it was well watered; and as the weather was very dry, a mat was thrown over it for a few days, to exclude the heat of the sun. Under this management the plants soon established themselves and increased rapidly, the roots having in about *ten weeks* penetrated the soil in all directions. About the latter end of August, or early in September, he formed the bed for their final situation, *in an open, exposed part of the garden*. This he made eighteen inches wide, and having thrown out the soil to the depth of twelve inches, he filled up the trench with well-decomposed manure, mixing it up with the soil at the bottom of the trench to the depth of another foot. The surface was then reduced to a proper height, on which the plants were placed, having, in order that their roots might sustain no injury in removing them from the nursery-bed, divided the soil into cubes with a spade, each having a plant in the centre of its upper surface, which were placed twelve inches distant from each other. He then placed a portion of the soil that had been mixed with manure round the plants, which were afterwards watered, and nothing further was done to them till the following spring, when the bed was cleaned by hand weeding, to prevent injury to the roots by the use of either hoe or rake, and in the course of the spring they were twice well supplied with liquid manure. About this period, to his great surprise, instead of one scape from each plant being produced, as he had anticipated, none threw up less than three, and the average number was five, all sufficiently strong to support the fruit above the foliage. Having previously observed, that after the first seven or eight blossoms on each scape had set their fruit, the remaining ones were so small as to be nearly useless, he cut off all the blossoms except this number. Thus managed, the fruit all assumed the cockscomb shape, and were unusually large and of a delicious flavour; indeed, so fine did they appear, that a professional gardener to whom they were shown could scarcely be persuaded that they were the pro-

duction of annual plants, which had not been twelve months in the bed.

To pursue his experiments, he left these plants till the following season, in order to see what sort of a crop they would produce, doing nothing to the bed but removing the runners and weeds. On examining one of the plants at the period when the blossoms began to appear, he found thirty-six distinctly formed offsets, three-fourths of which contained blossoms, but they were so weak that the stem did not exceed a rush in thickness, and the little fruit that came to maturity was small and ill-flavoured. This result did not, however, appear surprising, for on examination it appeared that the thirty-six offsets did not occupy a space of more than three inches in diameter, while the foliage covered the whole space appropriated to the plant, namely, twelve inches. In previously cultivating the Downton Strawberry, he had planted them in the spring, and obtained the same year a sprinkling of fruit; but in the succeeding summer, after waiting eighteen months, he had been uniformly disappointed, the crop not proving worth the trouble of planting; whereas, by the mode above described, at the end of twelve months, an excellent crop had uniformly repaid his toil. On the whole, he could not avoid coming to the conclusion, in which he was justified by repeated experiments, that the Downton Strawberry could never be successfully cultivated but as an annual.

In noticing the treatment of the plant, according to the common mode of cultivation, Mr. Darke observed that the cause of the injury done to the crop by the use of manure, arose from the length of time which elapsed between the plant being committed to the soil and its producing fruit. Mr. Knight had, in the Horticultural Transactions, justly observed, that "a great quantity of the sap was deposited during the summer months;" but a large quantity of foliage as well as runners, if the soil was rich, and the situation shaded, were at the same time produced; and it was evident that such a quantity of foliage must be prejudicial, by rendering the plants almost impervious to the sun and air, and by preventing the bud from maturing so as to produce fruit. Now, the reverse was the case according to the annual mode of cultivating the plant, for he had uniformly found that in proportion to the quantity of stimulating liquid manure used, the crop had been fine and abundant.—The lecturer, in conclusion, recommended the Downton, Roseberry, and Keen's Seedling, exclusively to those whose space of garden precluded the extensive cultivation of Strawberries. Of the two first of these varieties he had planted thousands, and

never had a barren plant. The Roseberry and Keen's Seedling came in early, and continued to yield till the Downton was ready, the fruit of both attaining an earlier maturity from the treatment he had recommended, and which he had found uniformly attended with the most successful results.

#### NOTES AND COMMENTS.

UNDER this head we propose to collect from various sources all subjects connected with Horticulture and Natural History that appear worthy of notice, and whether the notes be selected from our own correspondents, from publications of the present day, or from those of a period when bookmaking was less common, they will each be accompanied by such explanation and comments, as will render them intelligible, and enable every one to form a tolerable correct opinion of their value. The following are from the garden newspapers:—

**AURICULAS.**—A class of these flowers, styled Alpines, have made great advances of late. They are selfs, of all shades, from light pink and grey to dark crimson and deep purple, the eye or centre of the flower being yellow. Joined to extreme hardiness and beauty, they likewise seed profusely. They do not appear to be so susceptible of wet as the Auricula, and certainly are not so particular as to situation, flowering and flourishing almost any where. They are usually exhibited at spring shows, and cannot be too strongly recommended to the admirer of early flowers.—*Chronicle*.

[This is not our notion, and that is all we can say; they are purely a rock plant, and ought never to be seen any where but on rock work. There is a remarkable peculiarity in their colour, which very far from being selfs are always shaded, being darker close to the eye than at the outer edge, they are dark purple inside, and shade off to a lilac at the edge, or deep orange inside, shaded off to a light buff or dark slate and grey, or deep crimson and pink, in fact almost every color that can be imagined diversifies this tribe, but their peculiarity is that the closer to the centre the darker the shade. It is also a great mistake to suppose the eye is always yellow.]

**CELERY.**—In order to get this early, without much risk of the plants running to seed, it should be sown in shallow pans about the beginning of March, and placed in heat until it forms its first leaves, when it should be pricked out into a cold frame, and remain there until May, when it may be finally transplanted into the open ground.—*Ibid*.

[Suppose these directions to be implicitly followed, there will be very little risk of any of it running to seed, and not much of your hav-

ing the trouble to plant it out. The plants ought to be pricked out in pans, and be continued in moderate heat until they acquire strength, unless the writer means by a cold frame, a frame moderately warm. Celery, with only its first leaves can no more stand the transition from heat to cold than ice can the transition from cold to heat.]

**ROTATION OF CROPPING.**—Though one vegetable may be grown on the same ground for years, yet such a method induces a greater expense for manure and labour than when a regular system of rotation is adopted, as the culture of one vegetable often prepares the soil for the growth of another. The chief rule to be observed with all annual vegetables, is never to have two crops of the same class directly following each other. Though excellent plans of rotation may be laid down, yet the period that will elapse before the ground is again occupied by a similar crop will depend upon the wants of the establishment and the quantity of ground at the disposal of the gardener. Those who require to have several crops on the ground at the same time, will find that Celery gives a good preparation for Carrots, Turnips, Parsnips, Onions, and early Cauliflowers, or for Peas, with Potatoes and Winter Greens, or Broccoli between the rows. Autumn sown Onions may be succeeded by Spinach, Lettuce, &c., and early Cauliflower by autumn Onions. Spring-sown Onions will be advantageously succeeded by Cabbages in beds, with Scarlet Runners between; and if the Cabbages stand all summer and next winter, the ground will come in, in the spring, along with Broccoli ground, for Celery, Potatoes, and Peas, the early Potatoes being planted in the trenches, and the Peas sown on the ridges.—*Ibid.*

[This is very good advice, but it is very old, some of our very earliest papers inculcate the same thing. For instance, Mr. Brady in his *Cottage Gardening*, page 50, vol. i., gives in a small way a system of rotation cropping for one rood of ground.]

**ASHLEAVED KIDNEY POTATOES.**—I bastard trench a piece of rich light sandy ground, about 18 inches deep, and break it well with a spade. At the bottom of each trench is spread some half decomposed horse-dung, about four inches deep, and on this I plant the sets whole, cutting a small piece of the narrow end off, as as I consider it is useless, and placing them upright, the ground is planted as the trenching proceeds; the tubers are laid in lines fully nine inches deep and nine inches apart in the rows, which are 18 inches from each other. I cover the surface of the ground for about three inches deep with dung, similar to that which is put into the trench. They receive one

moulding up when the Potatoes are about six inches high; a little damaged salt is mixed with the soil, which causes the Potatoes to be well flavoured. By adopting this plan an excellent crop may be produced early in June if the tubers are planted between the 25th and 30th of January. In taking up the crop select the the best ripened ones, and let them be thoroughly dried in the sun until they become shrivelled; these will always come earliest.—*Ibid.*

[We object entirely to cutting the Potatoe sets at all, it lessens the quantity of nutriment provided for the early growth, always causes bleeding and sometimes rotting, and if they be cut time enough to dry the wounded part before planting, they frequently commence a kind of mouldiness which ends in disease; the salt too may as well be saved for the water they are boiled in.]

**GARDEN VARNISHES.**—The mixture is as follows:—1 gallon of pale linseed oil, 3 oz. of sugar of lead, 10½ oz. white resin, and ½ lb. mutton suet. These simmered together will make a useful varnish.

[The cheapness of Mr. Whitney's composition which is now sold in bottles, has completely superseded home made varnish, for there is great danger in making all varnishes, they so easily take fire.]

**ERIOSTEMON BUXIFOLIUS** — **BOX-LEAVED ERIOSTEMON.**—The Horticultural Society have awarded a Banksian medal to Mr. Glendinning, of the Chiswick Nursery, for a specimen of this beautiful plant, which he states to be one of the prettiest plants we have, and that it may be forced into flower at any period during the winter months. Its fine dark green foliage, and neat habit, combined with its abundant snow-white, sweet-scented blossoms, render it an object of much interest. It will stand a good deal of forcing without the least injury, and remain in blossom for a considerable period. It is, therefore, a plant not only desirable for summer exhibition, but more especially for decorating the conservatory or drawing-room in winter. Cut sprigs of it are very useful in making bouquets.

[This plant can hardly be prized too highly, and we are glad to see its value is becoming known. It was first exhibited years ago at the Horticultural Society, in the finest condition imaginable, by Mr. Glenny, who was the first also to introduce there the *Eriostemon Cuspidatus*. The white star-like blooms come at the axils of the leaves all along the branches. The difference between the two plants is that the leaves of the one are about the size of the leaves of the Box, and the other are considerably elongated, and not so close together.]

**REASONS WHY A GARDENER IS THE MOST EXTRAORDINARY MAN IN THE WORLD.** — Because no man has more business upon earth; he has good *ground* for what he does. He commands his *thyme*; he is master of the *mint*; he fingers the *penny-royal*; he can raise his *celery* every year, and it is a bad year that does not bring him a *plum*; he meets with more *boughs* than a minister of state; distemper, fatal to others, hurts not him; he makes raking more his *business* than his *pleasure*, and renders it of advantage to his health and fortune, which no other man does; he can boast of more *bleeding hearts* than any other man, and of more laurels than the great Duke of Wellington; he has more *painted ladies* in his possession than the Grand Seigneur: but his greatest praise, and the world's greatest envy is, that he can have *yew* when he pleases.

[These reasons are all very well in their way, but we should like to know the reason why gardeners are not better paid for "raising celery and fingering penny royal."]

**PROLIFIC APRICOT TREE.**—A Breda apricot tree growing in the garden at Arundel Castle, in the year 1838, covering about one thousand superficial feet of wall, and had been planted about seventy years, had the following enormous crop:—

	Doz.	
Aug. 15. Ripe fruit gathered	40	480
20. " "	50	600
24. " "	20	240
28. " "	62	744
30. " "	75	900
Sep. 2. " "	6	72
11. " "	14	168
Destroyed by wasps, &c.	54	648

Ripe fruit	321	3852
Thinned for tarts, &c., when unripe . . . .		13,885

Total 17,707

[This like all other trees will bear better when allowed to grow to maturity without any act of violence which is too often done to induce early bearing.]

**SILEX IN STRAW AND GRASS.** — Sir H. Davy found that canes, on collision, produced sparks similar to those obtained from flint and steel. On examining the epidermis, he observed that when that was taken off, the canes no longer gave light on collision. The appearance of the epidermis of reeds, corn grasses, induced him to suppose that they likewise contained sillex, and by burning them carefully, and analysing their ashes, he found they contained it in rather larger proportions than the canes. The corn and grasses, he found to contain sufficient potash to form glass with their flint. A very pretty experiment

may be made on these plants with the blow-pipe. If you take a straw of wheat, barley, or hay, and burn it, beginning at the top, and heating the ashes with the blue flame, you will obtain a perfect globule of hard glass, fit for microscopic experiments. And it is by no means uncommon, after the burning of a haystack, to find glass in the ashes.

[It is thus, that trifling circumstances in the hands of clever men, induce experiments, which often lead to valuable results.]

**EXPERIMENTS ON ROSES.** — During the summer of 1842, six beds of Tea-scented Roses growing in an alluvial loam (the adjacent fields are of the same soil, and grow large crops of Wheat and Potatoes, but the particles of soil run together after rain, and present a smooth cemented surface) were manured with the following substances, viz., 1, bone dust; 2, burnt earth; 3, nitrate of soda; 4, guano; 5, pigeon-dung; and 6, decomposed stable-manure. The guano produced the earliest visible effects, causing a vigorous growth, which continued through the season; the flowers, however, were not so abundant, and the shoots did not ripen well, and were consequently much cut with the frost. The bed manured with burnt earth next forced itself into notice; the plants kept up a steadier rate of growth, producing abundance of clean, well-formed blossoms; the wood ripened well, and sustained no injury during winter. The results of the other manures were not so remarkable—acting as gentle stimulants, the nitrate of soda and bone-dust least visibly so—although they were applied in the quantities usually recommended by the vendors. From the fact of the beds of Roses being all planted at the same date, and their progress being carefully watched, I would suggest the application of burnt earth as an excellent manure for Roses in adhesive soils, as well as for fruit-trees where disposed to canker. Whether it acted by furthering drainage, or by opening the soil to the fertilizing influences of the atmosphere, or by fixing the ammonia conveyed to the soil by rain, I do not pretend to say, but its value is sufficiently apparent. I believe it is considered that the vegetable matter contained in soils is destroyed by the act of burning; and I do not think the remains of the materials used in combustion could exercise any extended influence, as the quantity compared with the earth burned is so small, and the earth comes from the heap burnt red and hard, and a great portion quite free from the remains of the substances used in ignition.—*W. Paul, Cheshunt Chronicle.*

[There is a remarkable character in bone dust as a manure, and it would be very ac-

ceptable if Mr. Paul who sends this information to garden newspapers, would report the result of the next year's growth as we opine that the bone dust will have the advantage. The difference between guano and pigeons' dung, would be only in the strength. The former being from vegetable and the latter chiefly from animal food, still the effect the second year will be useful, but it should be accompanied by the quantity per rod or per square yard.]

**THE BROWN SCALE.**—The following communication was made to the Horticultural Society by Sir C. Monck, Bart. :—"I ascertained by experiment that an effusion of camomile would serve to clear Orange-trees of their most baneful pest, the Brown Scale. I am confirmed in the opinion; my trees are cleared, and have proportionably recovered their health." The fruit exhibited were in good condition, and were stated to have been gathered from a small tree which had had no more accommodation than was afforded by a shady vinery in summer, and the same sunny vinery in winter.

[We ought to be able to receive such a communication as an authority, although there have been many instances where the wrong cause has had the credit of producing an effect.]

**BROCCOLI.**—Grange's Early White, and Chapple's Early Cream, if sown at three different times between the beginning of May to the end of June, will produce heads in succession from Michaelmas to Christmas. —*Chronicle.*

[The Editor should have added—if the frost does not take the liberty of spoiling this arrangement, and which is not at all unlikely.]

**PHILLYREAS** may be struck from cuttings, but it is a very uncertain way; they do much better to be layered in pots about Midsummer. In striking them from cuttings select the previous year's young wood, before the shoots begin to grow, after Midsummer, and placing them in a light sandy soil, cover them close with a hand-glass. They should be placed in a north aspect, out of the sun's rays. When the cuttings are first put in, give them a good watering; but afterwards let the glasses remain close until they are struck. —*Chronicle.*

[So says a contemporary, but it is far better to layer them in the ground at Midsummer, and cut them off the next spring before they begin to grow].

**HYACINTHS.**—In order to preserve Hyacinths (which have been grown in glasses), for the next year, it is best to transfer them, after flowering, to the open air, where they can be plunged in soil, and guarded from frost, which will be sufficiently effected by mats thrown over them at night. —*Ibid.*

[Nothing will preserve the Hyacinth that has been bloomed in water, in a state to bloom well again the following season, they are only fit to grow in the borders, where they will split into offsets, which may be planted in beds, and grown until large enough to bloom as well as the parent. See Vol. ii. pp. 184, 152].

**CUCUMBERS.**—For two years past I have entirely discarded the old method of growing Cucumbers on dung hot-beds, or of allowing them to grow on the surface of the soil at any time. I find that by training them to trellises I have not half the trouble with them that is required by the old plan, and that the plants continue much longer in bearing when so treated. I have had plants in this way continue in a bearing state and in perfect health for upwards of twelve months, and it is very seldom we are without Cucumbers here all the year round. The true Sion Cucumber is the kind that I prefer before all others for general cultivation; it is a hardy and prolific bearer, and answers either in winter or in summer for pot-culture or for planting out in beds. Of the long kinds the best I have met with is one that was sold in London two years since, under the name of the Superb White Spine; it is hardy, and a good bearer. I had three lights of it last year, which kept in bearing for 12 months, and would have borne longer if they had been allowed. It frequently grows from 22 to 26 inches long, and is a very handsome-shaped fruit. From one plant of this growing in a box standing on the footpath in a corner of the Pine-stove, I have cut, since the middle of January, seven brace, averaging 18 inches in length each. The black-spined sorts appear to require a stronger heat, and are of a more rambling habit than those that are white-spined; but I have just now in bearing three lights of Latter's Victory of England, which seems to be a very hardy sort, as well as a handsome and prolific bearer; it is the best black-spined Cucumber I have yet met with. —*Robert Reid, Noble Thorpe.*—*Chronicle.*

[It would not do for all to think alike. We would never cultivate a variety with white spine, but this is of course fancy. We would never give one a prize, nor even allow one to be shown. However Mr. Robert Reid thinks differently or he would not write thus to a garden newspaper].

**VINEYARDS.**—When we consider the trifling expense of cultivation, and the valueless soil in which the Vine will succeed—(it will ripen much better, and be finer flavoured, on a hot, dry, poor soil than on one rich and moist)—it is certainly very strange that this branch of our domestic and rural economy should have been neglected this last 150 years. On the warm gravels of Hertfordshire, the sands



of beds and the chalky hills around Brighton, Dover, Deal, &c., which are exactly the localities and soils chosen in Normandy where the Vineyards are situated, it may be safely asserted that no other crop is so profitable on this description of soils. The fruit in this country, in the worst of seasons, when not sufficiently ripe to be eaten, is fit for wine, pies, tarts, &c. The following sorts are well adapted for this country—White Muscadine, Burgundy, July, Verdelho, Turner's Hardy, Esperione, and Black Cluster, and never fail of a crop. A plantation may be made with cuttings about 18 inches in length, of well ripened wood; layers the second year, and cuttings the third year, come into bearing, and continue prolific for ages. Plant your Vines four feet apart every way; dig holes, and in each put a very little rotten manure; place your plant in the centre, and firmly press the soil round the plant; cut layers down the first year, cuttings the third year, leaving about six eyes only to break from; this to be performed in February; select three of the strongest shoots to remain to each plant; always retain last year's wood for bearing; the summer pruning consists in stopping each shoot when four feet high; at which height they must remain, and cutting away all laterals; the three shoots to be tied loosely, as Raspberry canes, to admit the light, &c.; the ground to be kept clean by HOEING only.—*Chronicle*.

[That grapes grown on poor soil could be made into wine is certain, and that the Vine will grow on a poor subsoil is true enough, but it must have something better to root in. We know that on the Continent they grow and bear well, where there is hardly a foot thickness of soil on the hard rock, but that foot is cultivated with the greatest care.]

KNIGHT'S MONARCH PEAR is stated to be hardy and a good bearer, succeeding best as a standard, and bearing rich and melting fruit which keep well until January.

THE DUNMORE PEAR, raised by Mr. Knight, is perfectly hardy, and the fruit attains a large size, on a standard partaking of the flavour of the Brown Beurré, when the latter is perfectly ripened.

BLUE PERDRIGON PLUM, sometimes known by the name of Brignole Violet; is one of the varieties which furnish the Brignole Prunes; the fruit is of a purple colour, very rich, and comes into use soon after the Green Gage.

THE PERDRIGON VIOLET HATIF, in some respects, resembles the former, but is quite distinct, ripening much earlier; the flesh is so very rich, that, instead of decaying rapidly when ripe, the fruit will hang and become shrivelled on the tree.

[The above is from a report of the Horti-

cultural Society, and it is presumed may be depended upon.]

## SKETCHES OF THE LEARNED SOCIETIES.

### THE ROYAL BOTANIC GARDENS AT KEW.

THESE gardens, as associated with an early and interesting period of the progress of botanical and horticultural science in this country, claim a notice in these sketches. The Royal Gardens are on the bank of the Thames, and were originally planned by that distinguished character, Frederick Prince of Wales, the father of King George the Third, and comprise an area of 120 acres. The surface is flat, but owing to the tasteful disposition of trees and shrubs, the grounds exhibit a considerable variety of scenery. They are nearly surrounded by wood, amidst which arises a pagoda or Chinese temple, to the height of 160 feet, and was designed by Sir William Chambers, who afterwards published a description of the Gardens and Palace of Kew in folio. The exotic or botanic garden was established about the year 1760, after the prince's death, by whom it had been planned, and chiefly by the influence of the Marquis of Bute, a great encourager of botany and gardening. By him it was placed under the care of Mr. William Aiton, who had long been assistant to the famous Philip Miller at Chelsea. A catalogue of the plants of this garden was first published by Dr. Hill in 1768, under the title of "*Hortus Kewensis*." A more scientific work under the same title was given to the public in 1789 by Mr. Aiton, the superintendent, assisted by Dr. Solander, which extended to three volumes 8vo.; and between 1810 and 1813 an improved and enlarged edition, in five volumes 8vo., was published by Mr. Wm. Townsend Aiton, the present curator, who succeeded his father in his appointment at the gardens, being assisted in the first three volumes by the late Mr. Dryander, and after the death of that botanist, in the remaining two volumes by Mr. Robert Brown, author of the *Prodromus Floræ Novæ Hollandiæ*, and justly considered as one of the first botanists of the age.

The first house to which the attention of visitors is directed is the palm-house, the dimensions of which are about sixty feet in length by fourteen feet in width. It contains about fifteen species of this tribe, amongst the most prominent of which is the *Corypha Umbrachillifera*, or Talipot plant, from the Isle of France, the fibres of which are spun by the natives into cloth. The second house, called the middle stove, is devoted to tropical plants from the East and West Indies, amongst which is the Bread-fruit tree, the attempt at

the introduction of which into the West Indies from the South Seas was the cause of the celebrated mutiny of the *Bounty*. A third house, which is of the highest degree of temperature, and technically called the "Roaster," is also devoted to tropical plants, amongst the most prominent of which is the *Papyrus Antiquorum*, from which the ancient Egyptians fabricated their paper, growing in water, in artificial resemblance of the inundations of the Nile; and at the alternate end of the building is the *Cyprus alternifolia*, from which the Ceylonese fabricate their plaits and sails. The fourth house contains plants from the Cape of Good Hope, Madeira, the South of Europe, and Botany Bay; and amongst rare specimens is a fine *Araucaria Cunninghamii*. The fifth house is exclusively devoted to Botany Bay plants, amongst which is *Araucaria Imbricata*, with several varieties of *Banksia* and *Dryandrea*, this collection displaying the great activity and enterprise of Sir Joseph Banks in his zeal for these gardens, as well as obtaining a collection of specimens illustrative of the botany of that country. The sixth house, called the *Geranium* house, is devoted to the dwarf palms and half Orchidaceous plants, where are seen *Strelitzia Augusta*, *Cycas Sassenalis*, *Ficus Elastica*, several Tree ferns, a fine specimen of *Phoenix Dactylifera*, or the Date Palm; *Zamia pumgens*, now in good bloom, having the appearance of a pine apple, and being two months in coming to this development; a very large *Agave Americanus*; several specimens of *Cereus* and *Euphorbia*, amongst the latter *E. Grandidens*, the plant from which the Indians derive the poison which renders their arrows so destructive. A seventh house is devoted to rocky and succulent plants, and contains many valuable and interesting varieties. The orange-house is of the dimensions of 140 feet long, by 60 feet broad, and contains a fine collection of trees, which, however, deteriorate much, and are of little interest, from their being transferred for the artificial decoration of Buckingham Palace, from whence they are returned very frequently denuded of all their leaves. The new house, originated by his late Majesty, is a splendid structure, being about 100 feet in length, by 48 in breadth, and with a height of about 40 feet, devoted principally to New Holland plants, which are in a very healthy condition. This is heated with hot water, and the arrangements are very well concealed in a subterranean excavation under the building, giving no trace of the means by which it is accomplished.

Amongst the plants in the grounds, the first which strikes attention is a tree grown from the slip of the willow over Napoleon's tomb

at St. Helena, a new species, and denominated *Salix Buonaparteana*, which is on the walk into the entrance of the gardens. The most remarkable specimen which these contain is, however, the *Araucaria imbricata*, or Chili pine, which, when ten years old, was exposed to the gardens, having stood in its present position for twenty-one years. The plant stands twenty feet high, the stem being two feet in diameter at the thickest part; whilst it never grows higher in its native country, where it is employed in making fences. This specimen merely requires temporary protection throughout the winter, and stood the severe one of 1837 remarkably well, being very little affected in its spines. There is likewise a fine *A. excelsa*, from Norfolk Island, standing thirty feet high; *A. Cunninghamii*, from New South Wales; and *A. Brazilianensis*, from the country which its name imports. Amongst other plants deserving notice are those of the green and black tea, injured to very slight protection; a fine plant of *Vitis Vinifera laciniosa*, *Salisburia adiantifolia*, *Laurus sassafras*, &c. A large tree of *Brussonelia papyrifera*, or paper mulberry, a native of the Levant, is fading, from the effects of the winter of 1837; and although still in active vitality, presents the singular phenomenon that not two of the leaves are alike in size or form.

The Gardens of Kew Palace, and the Arboretum are open to the public by a recent regulation every Thursday and Sunday from twelve o'clock; and the walks of the former have an extent of upwards of three miles. In these grounds are various ornamental temples, which have a picturesque effect in display, one of which is called the Mushroom Temple, and derives its name from an anecdote told of it relating to George III. It was built by the Princess Amelia, opposite, though very remote from, the bed-room of her father, and was completed in one night. On rising in the morning that monarch expressed his surprise that so large a mushroom had sprung up in the night, to which his fancy not inaptly compared it. In the Arboretum are several fine *Acacias* from North America, with variegated oaks, all in high perfection.

Until within the last few years, the Gardens had got into great disorder, were almost unworthy public notice, and nearly unknown. Through the exertions of Mr. Glenny, however, whose merits are well known to the Botanical as well as the Horticultural world, the Gardens have been put in good order, and great steps have been taken in labelling the plants so as to render them easy of reference. An intelligent man waits upon each company, and directs their attention to the most promi-

nent articles of notice. No specimens from the Gardens are sold, but exchanges are made with different public Horticultural Societies or private individuals. The Gardens are open to the public daily throughout the year, with the exception of Sundays, from one till six o'clock in summer, and till dusk in winter. B.

#### THE WATER PINK.

It is difficult in some cases to draw the line between the animal and vegetable kingdoms. The sensitive plant possesses qualities which entitle it to rank in both, but the most curious combination of vegetable and animal properties is met with in the Water Pink and the animal grass which grows in Port Mahon, in the Island of Minorca. They are thus described by Mr. Jones in his "Sketches of Naval Life:" As I sauntered along the shore of the harbour, my attention was drawn to a beautiful flower at the bottom, where the water was nearly a fathom in depth. It grew on a stalk about three-eighths of an inch in diameter, and about ten inches in length; was in shape like an inverted cone, about ten inches in diameter; and was variegated with brilliant colours—red, yellow, and purple. It was a beautiful thing, and I wanted it; so I determined to knock it off, hoping some chance might bring it to the shore. I threw, and I saw I struck it; when the water was cleared up, the stalk was there, but I could not discover the flower. After a vain search, I went on further, and came to another, near the shore; I thought I was sure of this, and got a stick to draw it to me, when, as soon as I touched it—quash—the whole disappeared. It was all animal—flower and all. I have since procured several, and have preserved them. The stalk is formed by concentric coats of gristly matter, which is transparent when the outer one is removed. It is attached to the rocks below. This forms a tube, which is an animal about seven inches long, with two rows of feet in its whole length; at its upper end is the head, and, rising from the latter the flower I have spoken of. This is formed by a vast number of fibres, each with an exceedingly fine and variegated fringe, placed like that of a feather; they do not form a single cup, but several; and their roots are so ranged as to produce a spiral channel reaching to the animal's mouth. They have a strong sensitive power, and as soon as touched, are dragged by the animal into the stalk. After a few minutes it ascends again, and the flower spreads out as before; doubtless they are intended for taking food. A touch will spoil them, so delicately are they formed. I cut off the flower and passed a paper under it in water; then,

by laying it on a board, and pouring water on it, spread it out as I wished it. They are of a cerialine species, and are called Water Pinks by the natives. I can take you, too, to parts of the harbour where the bottom is covered with tufts of grass, some green, some dark coloured; some in plain tufts, and others with a star in the middle; this grass, too, is all animal, and, if you touch it, will disappear in the ground. There is a large quantity of it just north of the hospital island.—*American Correspondent.*



FOUNTAIN.

THIS sketch of a Fountain illustrates our notions with regard to the different effect of those which send up a jet high, and others which are more ornamental but have all the jets lower down. We do not say much respecting the design, except that it is novel, and this has been our principal object in employing an artist without restricting his fancy.

## FLORICULTURE AND ITS PROGRESS.

OUR Floricultural friends, and we hope their name is Legion, have begun this season to do as we wished them to do. They have begun to inform one another the standard they intend to be governed by, or rather guided by. The Surrey Horticultural and Floral Society have decided that their rules for judging florists' flowers shall be those laid down in this work, and we consider that Society the leading authority in London, for they have decided to show all flowers in classes, by which means the best must win; whereas, on stands good flowers will carry bad ones through, or, which is perhaps worse in its effects, good flowers are thrown out by bad ones, and the stand showing is thus rendered useless to the public as a test. It has also been decided at this head-quarters of floriculture, that no one variety shall take more than one prize in one man's hands, so that not only other showmen not so good as the best grower, may take a prize with the same flower, but also that other flowers not so good may take their station below it. This is effected in the most easy manner by not allowing one man to put up more than one flower of a variety. A society has been established at Falkirk, where in other words they have come to the same resolution about the standard, by determining that the rules for estimating the properties of florists' flowers laid down by Mr. Glenny, shall be the rules to govern the judge's decisions, those being the rules published in *The Gardener*. We have mentioned these two Societies because they are new acquisitions, and print their determination in the circulars which invite the exhibitors, who therefore cannot be misled by the variation in the tastes of judges. The Norwich and Norfolk Horticultural Society was almost the first, if not quite the first, to set this example; and many country societies, indeed most of them, do the same thing, but do not, by publishing it in their circulars, let the exhibitors know it. We had some thoughts of publishing the names of persons who had determined to act upon those rules, whenever and wherever they may be called upon as judges, but the exhibitors will be released from a world of apprehension and doubt, if every society will but announce in their circulars the standard by which their judges are to award prizes. It is no use for the committees to inform us that they mean to be guided by the standard laid down in our work, unless they also inform the exhibitors in their circulars, for unless they know what points are valued, they cannot know how to set up their flowers to the best advantage, and

may, while they have specimens that would beat, actually show specimens to be beaten. We have already said, that although the Ipswich cucumber growers do not adopt our standard, they adopt some standard which they make known to subscribers and showmen, and therefore nobody can complain that they show without knowing what is required, and so it ought to be with every thing. No exhibitor ought to put up for a prize without knowing what the judges call good points. One man likes size, another man cares for nothing but colour, a third cares for neither and wants form. In short, a man without rules to go by may possess the best things and show the worst, and even then may win. It is this which induces us to congratulate our readers upon the fact, that societies are beginning to see the necessity of announcing the standard they mean to be governed by, and inviting the exhibitors to conform to it. The South London Floricultural Society has been the most fortunate in obtaining supporters and exhibitors, but the most unfortunate in providing judges of all the societies that were ever established. Of course we do not include the Floricultural Society (as it was called while people could be found to pay towards it), because that was a society of judges to pronounce the value of their own flowers, and as a matter of course there was no choice in the matter; but we mean that the South London Society, which is more liberally supported than any other round London within many miles, has had, since we commenced this work, the most unfortunate decisions upon the comparative merit of fruit, flowers, plants, and vegetables, that we ever remember to have seen elsewhere. And why? They have no settled standard, no regularly appointed judges. On the day the flowers are shown, and after the subjects are all put up, they appoint their judges from people who happen to be there, and who for the most part have seen the flowers, or if there happen to be good judges present who have not seen them, there is generally one of the meddlers of the committee who thrusts himself upon them, and so if they would do right they are not permitted. All this has tended to injure the society, and if it have not actually lessened the number of members, it has at least prevented their increase. And certain it is, that the appointment of the judges becomes a far more onerous duty than people are aware of. Upon that depends much, and until men of character and sound judgment be appointed, it is impossible any society can get on. We are told that some societies are deeply in debt for prizes, indeed we have letters sent for publication which we should be

sorry to publish, because it would injure the societies to which they allude, and this we are loth to do; but exhibitors may always make up their minds, that if a society cannot clear up its debts for the year, before it calls for another subscription for the next year, it must be in a bad way, and there must be some cause for it. All we have to impress upon the conductors of shows now is, that it is not enough to adopt as their standard the properties laid down by Mr. Glenny, for it ought to be published in their circulars that they have done so, to make it really useful to the exhibitors, and let them know what they are to aim at.

#### MR. MOORE'S TREATISE ON THE CUCUMBER AND MELON.

MR. MOORE'S valuable papers read with so much advantage at the Regent's Park Mutual Instruction Society, will have rendered his name familiar; and the small treatise before us has the characteristic features which distinguish his numerous essays on various plants. If we get leave of Mr. Moore to show the sketch of his proposed pit, we shall resume this subject in connection with the Cucumber; at present we select only a chapter on Melons, a favourite and easily grown fruit, the character of which has by no means been raised by the inundation of coarse, ill tasted fruit from abroad, cheap enough certainly to introduce it some grades lower in society, but bad enough to condemn Melons in the estimation of all those who have not tasted the better kinds. In short, when we consider that a single light box with only dung heat, would always give a few of this delightful fruit, we wonder that any body who has room will forego the pleasure and gratification so easily produced. Mr. Moore commences his book with an elaborate treatise on the Cucumber, and describes at full the kind of structure he prefers; his chapter therefore, on the Melon, presupposes the structure already formed, and he says—

It is barely possible to suppose any use to which a structure which during the winter season had been devoted to the growth of Cucumbers, could be so legitimately appropriated in the summer, as that of the growth of the finer Melons of Persia, Cashmere, and the East. The superiority of such as these, in every point of view, over those kinds, which have been long in cultivation, would be an ample recompense for the appropriation of such valuable space to their use; whilst in no other structure could the peculiarities of the treatment they require, be so fully complied with, and be rendered so completely under control, as in that under consideration.

There are some peculiarities in the treatment of these Melons, to the consideration of which, it may be desirable to devote a brief space; the most important of these are, the composition of the soil, the application of moisture at the root, the regulation of atmospheric warmth, and also, of atmospheric moisture; in these particulars, they offer some differences to what has been previously stated, with reference to the Cucumber.

The soil in which the Melon delights to grow, is one of a more compact texture than is usually regarded as applicable for the Cucumber: a suitable compost consists of the "top spit" from a loamy pasture, of a texture *rather adhesive*, and retaining the herbage and roots of the grass; this should be collected a few months before it is used, so that these vegetable substances may be in a *decaying* state, and it should be broken roughly to pieces, but by no means sifted; to it, should be added, about one-fourth part of vegetable mould: the whole should be well incorporated, and before using, should be placed in a situation where it may not be liable to become saturated by heavy rain; which would serve to destroy the free and open texture which it is so desirable to retain.

In the application of moisture to the soil, the structure which is described in a previous chapter, will be found to present facilities, which peculiarly adapt it for the growth of these plants. In Persia and the neighbouring countries, where the Melon is so successfully grown, the ground is irrigated by means of numerous channels, which, from the limitation of their exposed surface, are not peculiarly adapted to supply atmospheric moisture; but are yet sufficiently numerous, to secure the perfect irrigation of the soil, within the reach of the roots. The tubes or shafts, represented at (n)\* in the sketch referred to above, are intended to communicate directly with a layer of coarse open material, extending entirely over the top of the tank, and beneath the soil; by means of these, a supply of water should be poured beneath the soil, which will thus keep that portion immediately about the young roots, in a constant and complete state of saturation, by means of the steam which will arise, in consequence of the heat from the tank. A uniformly warm, and a thoroughly moist soil, will be thus easily secured, which are two important points in the growth of Persian Melons. It must be recollected that these condi-

\* The sketch alluded to represents a bed formed on the top of a hot water tank. There is a layer of coarse drainage some inches in thickness, and the fine mould or compost is upon it. The tubes or shafts which communicate with this coarse material, enables you to administer water at the bottom among this draining, instead of wetting the compost from above.

tions for supplying moisture, are recommended only during the time of growing the plants, and swelling the fruit; but as these latter approach their maturity, the degree of moisture must of course be gradually diminished.

In connection with this moistened and genial soil, the Melon has naturally the advantage also, of powerful sun heat, and intense light; and these are two conditions, which it is indispensable should be supplied in artificial cultivation, as fully as they can possibly be obtained. It is by means of the moisture of the soil, that the plants are enabled to grow on rapidly and vigorously, because that moisture renders the food contained in the soil, soluble, and therefore available to the roots; but the elaboration and assimilation of this food, depends on the degree of *light* and *heat* with which they are supplied: without these conditions, to convert the crude sap by their united agency, into organic compounds, such as lignin, gum, starch, and sugar, and to induce their deposition, the fruit will indeed be formed—it will grow, and perhaps may even tempt the eye; but unless these chemical, and vital changes have taken place in its constituent parts, the eye, as it frequently happens, will have been deceived; and instead of the palate being gratified by a mature and luscious fruit, it will find nothing but a tasteless mass of pulp. The plants therefore, cannot in our latitude, receive too intense a degree of solar heat, or of light.

The same cause which renders the natural atmosphere of the Melon countries elevated in temperature, renders it also comparatively dry; the sun drinks up the moisture which is deposited near the surface, or which may rise to that position; and by an exceedingly powerful influence, effectually prevents the accumulation of moisture about the exposed parts of the plants. The atmosphere is nevertheless not in an arid state; the evaporation from a well moistened soil, effectually prevents this from being the case, but the excessive heat also as effectually prevents an undue accumulation of moisture in the atmosphere. The application of this fact, to artificial practice, is plain; a less amount of moisture artificially applied, in comparison with the temperature, must be permitted, than when the cultivation of those plants are attempted, whose natural habitats are less strongly featured in this respect.

Such considerations as these, naturally force on us the conclusion, that it is vain to attempt the cultivation of these noble fruit, except during that portion of the year, when the sun exerts his greatest power in our latitude. It is not because they cannot be induced to grow at any other period of the year, for the mere extension of vegetable tissue will go on, though

the influence of the natural agents is but limited and feeble; but it is because maturity, perfect development, and above all, the full assimilation of the sap, cannot take place sufficiently to ensure a good flavour in the fruit, except light and heat, are not only unimpeded and constant, but powerful and united in their action.

We shall endeavour to do justice to Mr. Moore's structure at a future time, but it cannot be done without a sketch of his pit.

#### TULIPS AND TULIP FANCIERS.

BY MR. FILE.

It would afford the writer much pleasure if, in naming the growers who first began in Great Britain to propagate tulip from seed, he could say that he was sure the parties so named really deserved the honour conferred upon them; but he must give them according to the best of his knowledge, without vouching for their accuracy, merely premising that he has heard of others, by whom flowers have been named, of an earlier date, but he has not felt thoroughly assured that the flowers so named were produced from seed raised in this country, it being a well-ascertained fact that many of our earliest Tulips of English breaking were from Dutch breeders. A reverend gentleman of the name of Wood was the first florist, of whom the writer had any knowledge, who raised breeder Tulips from seed of his own saving and sowing; his garden, now built over, was situated near to that of the late Wm. Gabel, in the City Gardens, City-road, London. At the death of the Rev. Mr. Wood, which occurred about forty years ago, the fine collection of Tulips he left behind him was treated in rather an awkward manner: the Tulips were for a short time in the possession of the above-named William Gabel as a proposed purchaser, and returned to the relict of Mr. Wood in a very disordered state, the boxes in which the named bulbs were placed having been either purposely or accidentally upset. They were afterwards of necessity sold at a reduced price, in consequence of the suspicion attached to the above-mentioned circumstance; Mr. Davis, a private fancier, in conjunction with the late Mr. Drinkwater, whose flower-gardens were adjacent to the Rev. Mr. Wood's, in the City Gardens, bought the offsets of the named flowers, and such of the seedling breeders as were returned to Mrs. Wood by Gabel. From one of those breeders that beautiful bizarre Tulip, "Strong's King," and all of that species were produced. A more certain or steadier flower than the "King" has never yet been seen by any

florist. The next florist of this class, whose name occurs to the writer, is the late Mr. Pearson, of Nottingham. This florist obtained his seed from broken or named flowers, and for some short time a few of those which he brought into notice were in some repute, but of late years so many others of far finer quality have been produced, that his name as a raiser and grower from seedling-breeders has gone out of date. The third was the late Mr. Drinkwater, a very eccentric florist, one who really destroyed more flowers than many other florists ever possessed; peace to his manes; but few of his day were found more liberal as purchasers, or more desirous of promoting improvement in floriculture. He certainly had some rare and beautiful specimens of seedling-breeder Tulips, and they came afterwards, many of them, into the possession of the late Mr. Strong, of Hammersmith, the present Mr. Goldham, of Albion Cottages, Islington, and Mr. Greig, of Hackney Wick, each of whom have produced finely broken flowers therefrom. The late Mr. Austin, of Clapton, one of the best supporters of the Tulip fancy in England, some forty years ago, raised a few seedling-breeders, but never produced from them anything very particularly worthy of notice here; his "Mrs. Miller" is the only Tulip of his growth to which he ever gave a name, at least it is the only one that ever came under the cognizance of the fancy, and is not of very high repute. The late Mr. Holmes, of Clapham, raised many original and good Tulips from seed; his "King," his "William Pitt," and his "Emperor of Austria," grace every fine bed of Tulips in the kingdom; his "Louis the Eighteenth," a rare and precious byblomen, is in the possession of only one fancier, Mr. John Goldham.

The late Mr. Strong was a raiser of seedling-breeders, and, as is known to most Tulip growers, produced, or rather named, more flowers than any other fancier of his day; but it was hard, at all times, for a third person properly to designate from what breeders they came, perchance he did not know himself, he being a purchaser from all growers of good repute. This was a well-known fact, although at variance with his reports respecting several excellent flowers, bought from other florists, either in the breeder state, or, as was the case with his "King," in a broken state, for if asked to which tribe of breeders any newly named one belonged, the answer was always, "From my own seedlings, certainly." There are flowers from this gentleman's collection, broken from breeders formerly the property of a Mr. Coombes, whether seedling or otherwise I have not learnt;

from those of the late Rev. Mr. Wood; from the late Mr. Drinkwater's, and of those the number is pretty numerous; Mr. Davis's, Mr. Gabel's, and the late Mr. Clarke's, of Croydon.

Mr. Clarke, almost at his first set out as a fancier, began to save Tulip-seed, and to raise new breeders. He exhibited considerable judgment in selecting his sorts to save seed from, and also in culling all the bad forms, weak stems, and dirty bottoms from his new-blooming seedlings. He took the lead in this department from all contemporaneous florists; and so many first-rate Tulips have been produced, and still are producing, from his collection of breeders, that his name must be handed down to posterity as one of the greatest contributors of his day to the stock of English Tulips. He was a man whose love for the fancy was as unbounded as his liberality to other florists, and his judgment of the qualities of a fine flower has never yet been disputed.

In speaking of living florists, I wish to avoid the invidiousness of selection, but so numerous are now the growers of seedling Tulips, that of necessity I can but mention a few of them.

Some four-and-twenty years ago, Mr. Franklin, florist of the City-road, raised an immense number of seedlings from broken flowers, which for the last six or seven years have been breaking freely; many of them are good flowers, but they are not as yet much distributed among the fancy, and require to be more fully known before their qualities can be fairly estimated. Mr. Bowler, of Albany-road, Camberwell, also raised seed from named flowers. At its first blooming, as I am credibly informed, without being seen in the breeder-state at all, his "Everhard" astonished the fancy by its originality, delicacy of tint in colour, and extreme beauty of form. The stock of this flower was purchased by Mr. G. Glenny, of Worton, a fancier remarkable for great abilities, and equally great desires to promote the best interests of florists and floriculture. I sincerely hope he will be as successful in blooming and in increasing the "Everhard" as he deserves to be. It may be necessary to add here, that Mr. Bowler's collection of new or broken flowers from seedlings contains many other beautiful specimens.

Mr. Greig, of Hackney Wick, possessed many of the late Mr. Drinkwater's seedling breeders, and some varieties also of the late Mr. Clarke's: part of these are still in the possession of Mr. Alexander, of Lamb Farm, Kingsland, as well as a stock of seedling breeders, raised by Mr. Greig about twelve

years ago. From those he had of Mr. Drinkwater came "Rose Juliet," a finely-broken flower; and from those of Mr. Clarke the "Star of Brunswick," the only evil attached to which is, that it will not increase so rapidly as the possessor desires. About 1834—5, Mr. Greig seeded an entire bed of eighty rows of fine-named flowers, and the progeny arising therefrom has been so exceedingly large, that his collection, not yet arrived at a blooming state, is calculated amounted in 1839 to 100,000 bulbs.

The last florist whose name I shall introduce into this portion of my essay is Mr. John Goldham. As I have before stated, Mr. Goldham was a purchaser to a considerable extent of seedling breeders raised by the late Mr. Drinkwater: he has also purchased largely from the late Mr. Clarke's raising, and from the beds of other fanciers; independently of which, he has for many successive years raised fine seedling breeders himself: the result is, that he is now reaping a rich harvest of beautiful and finely-broken Tulips, of first-rate quality: several of them have already been portrayed, and have appeared in the *Horticultural Journal*; and one, both rich and rare, his "Constantine," graces the first number of the *Floriculturalist*. There is no fancier in existence who has taken more pains to form a fine collection of Tulips, nor any exhibited sounder or better-directed judgment in the selecting of them. It is almost unnecessary to add, that amongst florists in the immediate vicinity of London, he stands unrivalled and alone. Long may he live and enjoy his pre-eminence!

Before I conclude the historical portion of this essay, I will state that, although with the Tulipomania of the Continent in the seventeenth century all gambling in Tulips may be truly said to have ceased, yet the rarity and beauty of some sorts have continued to command prices quite astounding to the uninitiated. I will here introduce a few instances, to prove how well-grounded this statement is. The species called "Louis XVI." appears, for the first time, in a Dutch catalogue, of 1792, now before me; and is there priced, as a then new flower, at 300 florins, or £25. It is not very many years ago, that the late Mr. Austin offered Mr. Goldham for a "Louis XVI." then in bloom, £73 : 10s. and the offer was declined. "Ponceau tres Blanc Superfin" came out at 40 florins, and very recently the writer, wanting the true Dutch "Ponceau," paid £6 : 6s. for it. Rose Camuse\* was introduced into England at the price of 6 florins, and has in many instances, and for many years, not only under its proper name, but also as "Rose Brilliant," produced from

£2 to £3 per bulb, and in two or three instances £4. The first price of "Violet Quarto," now about forty years old, was 3 florins. "Violet Quarto Superfine," or as it is now termed in this kingdom, "Violet Alexander," has been frequently imported at the same price; not many years since, I stood by the side of a first-rate fancier, when Mr. Brooks, then of the Nursery, Ball's Pond, Islington, demanded and received £5 : 5s. for a bulb of it. "Superbe en Noir" came amongst us at the price of 10 florins, and has since commanded, in many instances, a price of as many pounds. I will here mention one instance of great depreciation, the most remarkable on record. "Semper Augustus," which in 1636 was sold for 7000 florins, or £582 : 6 : 8d., I find catalogued in 1792 at 10 stivers, or 10d.

The late Mr. Davy, of the King's-road, Chelsea, broke a Tulip, and named it "La joie de Davy;" for this flower he was offered £167 : 10s., and declined taking it. For the "Polyphemus," raised by the late Mr. Lawrence, of Hampton, from a seedling-breeder of Mr. Clarke's, the sum of £50 was given for four bulbs, after it had been broken three years, and although it was known to the buyers that several roots of the same flower remained in the possession of Mr. Clarke and his friends. For the stock of another new flower, called "Fanny Kemble," consisting of a main root and three offsets, raised also from a seedling-breeder of Mr. Clarke's, the late Mr. Davy gave £100; these were resold at his death, which occurred a few months after his purchase, for nearly the same sum; and Mr. Goldham was the buyer; in his possession the stock of this fine flower still remains. Mr. Holmes, of Clapham, raised the "Louis XVIII." from a seedling-breeder. At his death, Messrs. Milliken and Groom, of Walworth, bought his collection of Tulips from the person to whom they were bequeathed, and afterwards sold the "Louis XVIII." to Mr. Goldham for £42; and so recently as the year 1838, Mr. Glenny bought the stock of the "Everhard" of Mr. Bowler, comprising seven roots, for which I believe £140\* was given. I could multiply instances of extraordinary value attached to Tulips even in modern days, *ad infinitum*, but conceive enough is stated above to prove that, without gambling or artifice, there really is no decrease in the value of fine ones, nor any want of admirers of them.

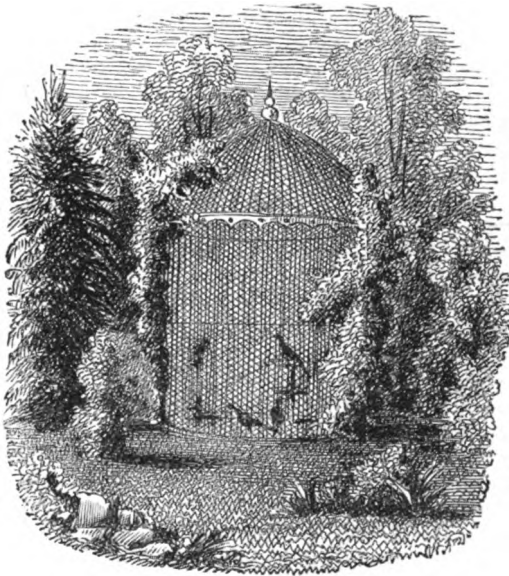
\* The stock, Mr. Glenny says, was stolen from his garden by a man in whom the greatest confidence was placed, and not a vestige of it left on the premises. Mr. Glenny has never grown a Tulip since.



## CORNELIAN CHERRY.

THE Cornelian Cherry, *Cornus Mascula*, is now removed from the orchard to the shrubbery; but even in this latter situation it is at present so very seldom seen, that many persons do not know that this beautifully transparent fruit exists, which flourished in the earliest gardens, graced the tables of our forefathers, and furnished them with fruit for tarts, jam, and marmalade. Tusser, who wrote in Queen Mary's time, calls them "cornet plums." Lord Bacon frequently speaks of them amongst the fruits of his day, by the name of Cornelians. Pliny speaks of this fruit in a manner that induces us to think that he considered it as indigenous to Italy as well as to Austria. He describes this tree in the 40th chapter of his 16th book, and says he cannot rank it among timber-trees, as it does not arrive at any great size, but that its wood was nearly equal to iron for making pins and wedges to cleave wood. In the south of France it is often used for props in the vineyards, and to make hoops for wine-casks. The flowers of this tree appear before the leaves, and sometimes as early as the

beginning of February. They grow on umbels, of from fifteen to thirty flowers each, of a small size and yellowish colour, and therefore make no great show; but the fruit, which is ripe in August, has a very fine effect, as it hangs like so many cornelian drops from the branches; and it is as transparent as the stone of that name, or as the jelly of red currants, and about the form and size of an olive. The stone is oblong, pointed at one end, and rather larger than a grain of wheat. The pulp, which forms what is commonly called the fruit, is less juicy than the cherry, but more so than the plum. Its flavour is peculiar, but to some persons the sweet and astringent taste is extremely agreeable. It used formerly to be pickled in salt and water in its green state, as a substitute for olives; and we find from Pliny that the Romans had the same practice. Dr. James says this fruit is cooling and astringent, strengthening to the stomach, and good in fevers; especially if attended with a diarrhoea. It gives as lively a red to blue paper as alum, which inclines us to think that it contains a salt analogous to it.—*Phillips' Sylva Florifera*.



## AVIARIES.

NEXT to fountains, perhaps there is hardly a more ornamental subject than an Aviary, but it should be in some sheltered place, out of the general view of a garden; and when reached should be picturesque. There should, however, be some taste in planting about it, and

no place would be more appropriate than one of those nooks which we recommend to be made by way of concealing the real boundary, and making it appear that such nooks lead to some distance.

CLIANTHUS PUNICEUS  
TRAINED AS A STANDARD WITH DROOPING  
HEAD.

THIS beautiful plant is grown on a trellis or a wall, and in many respects is treated as a climber, but it can be trained like a standard, and the following by a practical correspondent shows that almost the same treatment will do for anything that is required to form a tree instead of a shrub. There is no material difference in making standards of anything.

The *Clianthus Puniceus* is well worthy of a place in every collection, both for its beautiful foliage and pendant racemes of red flowers. When grown as a standard, it far surpasses in beauty and elegance any plant I have seen of its kind: I shall mention a few words regarding its culture as a standard. Select cuttings from a plant about the beginning of May or June; the cuttings should not exceed four inches in length, and taken from the same year's growth; recollect that the extremity or point of the cuttings must not be pinched off. After making the cuttings, allow them to remain for a day or two before potting, to dry some of the superabundant moisture from them, which is an advantage gained by the cuttings rooting two days sooner. A 32-sized pot should be filled with white sand, and the cuttings inserted therein, to the depth of two or more inches; they will strike readily in a heat of 70 or 75 degrees; if they are covered with a bell-glass the strike will be more successful. Having struck, they should be potted off separately, in thumbs or small sixties, amongst a compost of sand, leaf, loam, with a little well-decomposed cow-dung, all well incorporated together; when potted, they should be placed in a bottom heat till they have matured roots enough to support themselves. Then they should be removed to a more airy situation, either to a greenhouse or conservatory, and great care and attention must be paid to the repotting and watering, or without, the plants will soon form a sickly, stunted appearance. For to make good standards, all side-shoots must be pinched off as soon as they appear, training the plant up with a clear stem to the necessary height required; then, after they have attained the required height, the tops should be pinched off; and that causes them to throw out laterals, and these laterals again stopped, makes them still to throw out the more, till at last the plants attain a most luxuriant head, richly decorated with thick but dense pale green foliage. When treated after the above method that I have laid down, then planted out in a conservatory, amongst good rich mould, one half fresh loam, one-quarter leaf mould, and one-quarter decomposed cow-dung, along with a

little vegetable mould and sand; all these to be well incorporated together, and a pit made for the reception of the plants three feet square, by two and a half deep, filling it up with the above composts, then insert the plant, putting it about an inch deeper than it was in the pot; then there should be a good stake of durable wood procured to fasten it to. When planted out, it grows more luxuriant than in pots, and has always a more healthy appearance than it has when grown in pots. When in flower, what can surpass it? the bunches of pale red flowers hanging the one upon the other, out of a dense thicket, as it may be termed. It is decidedly an advantage, and more especially in a conservatory, where plants of a minor species can be grown under its lofty head.

We have seen this shrub very nicely grown in a pot, by pinching the cutting down at first, and allowing three or four shoots to run up to the height of three feet, supported by a trellis almost like an umbrella frame, being fastened round the standard or handle, until they grow higher than the top, when they were pinched off a foot above, and the side shoots that come out above the trellis were allowed to grow a few inches, say six, and were pinched again; the head would form a beautiful object, because the trellis prevented the bunches from hanging down too close to the stems which formed a sort of trunk to all appearance, though they carried a much better head.

#### THE GRAPES OF FRANCE AND SPAIN.

As the Vine seems to occupy the attention of many persons who never attempted to grow one before, and the different varieties of Grape both abroad and in this country interest the many, we give a few of the leading varieties of France and Spain with something like a brief description which will be the more acceptable because many of them have been introduced by common-place travellers without names.

In France there are 570 varieties of Grapes of various shapes, colours, and quality. In Spain, so renowned as a Vine country, which may be justly considered one of (if not) the first in the world, there are not more than 200 varieties, 120 of which are cultivated in Andalusia, the others near Malaga, Catalonia, &c., for drying as raisins, or making of wine for exportation. The following are the most important, and are the means of giving occupation to thousands of the horticultural and agricultural peasantry.

*Vines of Rousillon, in the South of France.*

*Carignan*—Crignane Cavoleau—black, with a thick skin, deeply coloured, yields largely.

This Grape by itself would produce a dry wine. It is rich in saccharine matter, although harsh to the taste, and very mucilagenous.

*Grenache*—black, skin very thick, but yielding less colour than that of the preceding. This Grape by itself will yield a sweet wine. It is rich in saccharine matter, and strongly impregnated with aroma.

*Mataro*—black, skin less thick, but yielding a good deal of colour. This Grape yields the most abundantly, and of itself gives a dry wine. This is the only vine of the province that yields annually and almost equal vintages; the other varieties sometimes yield abundantly, but their produce is uncertain. (The above three varieties are in general equally distributed in the vineyards of the department of the Pyrenées Orientales, and furnish the wine of exportation known by the name of *Vin de Roussillon*).

*Mourastell*—black. This variety differs very little from the *Mataro*, but the Grapes are rather smaller.

*St. Antoine*—black, the Grape very large. It is a very good eating Grape, although the skin is rather strong. The wine made from this Grape by itself has a very agreeable flavour, but it yields very little.

*Blanquette*—white, thin-skinned, of a very good flavour, yielding a heady white wine, which is employed in giving strength to the light white wines of Languedoc.

*Muscat*—a strongly-flavoured white Grape, excellent for eating, yields little, and arrives early at maturity.

*Pique-Poulle*—a pink-coloured Grape, very fine skinned, and excellent for eating. It yields a light-coloured wine (*clairer*) of agreeable flavour, and fine bouquet.

*Hermitage*—it is a fine sized Grape both red and white, growing on the banks of the Rhone. It yields little, but the flavour of its produce is excellent, and is much renowned throughout Europe.

*Collioure*—panse, white, the bunches very large and long, the berries also large and long, produces plentifully, the flower resembles the Muscat. It is good both for wine and for eating, ripens rather early, and is a scarce variety.

*Pampanelle*—black, a very delicious Grape, but very tender. It decays easily after rain.

*Pique-Poulle Noir*—black. This variety does not produce much. It yields a light early wine.

*Greenache Blanche*—white. This variety is only used in the district of Collioure, to hang up for winter provision of Grapes. It produces plentifully: the bunches large, the skin very tough, and it has always a bitter taste.

*Rivesaltes* (Vin de Liqueur)—*Macabeo*—

white. This variety of itself yields a sweet wine, almost equal to the Muscat. The bunches are large, and keep well when suspended for winter provision. Small quantities of this wine are made for private consumption.

*Muscat*—This is the Grape which is chiefly used in making the celebrated sweet wine of Rivesaltes. On an average 500 stocks yield 200 bottles (quarts) of wine. There are three varieties—the Muscat of Alexandria, the round white Muscat, and particularly the St. Jacques.

*Montpelier Grapes*—(Of 45,000,000 gallons of wine annually produced in the department of Herault, 28,100,000 are converted into brandy and spirits of wine).

*Ayade*—white. Yields well, and is good for eating and wine. *Ayade*—black. Produces plentifully, and is good for making brandy. *Calignan*—black.

This is the best variety for making brandy: it yields well. *Ramonen*—black ditto. *Terret*—ditto, ditto. *Fontainbleau*—an excellent eating grape, and ripens very early, and is much renowned in Paris for dessert. *Espar*—white

—good for brandy. *Chasselas*—white. This is an eating Grape, and yields a good white wine. *Uque*—white—Ripens early, and yields good wine. *Muscat*—black. Yields well, and is good for brandy. *Madeline*—white. Ripens very early, but is neither good for wine or brandy. *Corinth*—black. Is excellent both for wine and brandy, and yields well. *Terret Bourret* is good for distillation. *Aspirant Verd*

*dal*—produces largely, and yields a fine wine. *Olivette*—a very large white Grape, good for wine and brandy: used at Bordeaux and Cognac to give a flavour. *Clariette de Limousin*

—produces abundantly, and yields a peculiar and excellent white wine. *Merveille*—black. Yields well, and is good for brandy. *Aspirant*

black. Yields largely, is good for eating and making wine, but not brandy. *Espar Noir*—good for brandy. *Pique-Poulle*—grey, good for wine and brandy. *Muscat*—white, for eating, wine, and brandy. *Cinque Saut*—ditto, ditto. *Bois Dur*—black, for brandy. *Aramon*

black, ditto.

*Roquevaire Grapes* (for the dried fruits of Provence).—*Panse* or *Passe*—white. This is the Grape which makes the best raisins of Provence. The bunches are large, the skin of the berry is tender. This is a very strong and vigorous vine, which requires a rich soil to give it all the development of which it is capable. Thus placed, it produces abundance of grapes of an extraordinary size, which are excellent both for eating and to preserve for the winter. It vegetates very early, requires to be pruned rather long, and succeeds perfectly in the trellis. *Aignan*—white. This grape is also dried for raisins. It is an ancient vine, and yields a very sugary grape when

ripe.

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cultivated on light, dry soils. It is mixed with the Muscat for wine. *Pascal*—white. Is good for eating, and for wine: is of abundant produce. *Panse Musquée*. Is a variety of the Muscat of Alexandria, and is fine eating. *Bouteillant*—black. Yields largely for making wine; is strong and vigorous. *Brunfourcat*—yields an excellent wine, and is originally from Bordeaux.

*Ciras*.—This variety is alone used in making the best red wines of Hermitage, brought originally from Shiraz, in Persia, by one of the hermits that resided on a hill of that name, on the Rhine. *Roussette*—yields a dry, spirituous wine. *Mursan*—white. This variety yields a sweet wine, and mixed with the Roussette, produces the best wines of Hermitage. *Pineau Blanc* and *Pineau Noir* are the only varieties cultivated in the Clos Vougeot, and other vineyards of celebrity for making the best white and red wines of Burgundy. *Pineau Doré*—black. This variety has been introduced into the vineyards of Ay, from Rheims, and is only confined to the most important vineyards of Champagne for producing that celebrated wine. *Pineau Vert*—blueish tinge. *Plant Blanc*, or White Pineau, are exclusively cultivated for the Champagne wines of the first quality. *Coulanges de l'Yonne*—black. Of this there are twenty-two varieties, which produce both a Burgundy and Champagne wine. *Liverdum de la Meurthe*—black. It yields a wine which keeps well ten years in cask, and is so prodigiously fertile, that it yields on an average, annually, about 2500 gallons per English acre. *Carbenet de la Gironde*—black. There are three varieties, and are exclusively cultivated in the vineyards of Medoc, yielding a wine of the highest reputation. *Sauvignon*—white. Yields the best white wines of the Department de la Gironde, including *Vin de Grève*, *Barsac*, and *Sauterne*.

*Folle Blanche, de la Charante*.—This is the variety of vine which yields the brandies of Cognac. There are three varieties called *Folle*—the white, the yellow, and the green: the two first are the best.

The other varieties are principally used for eating. The *Isabella*, an American black Grape, has the flavour of the raspberry; and the vine of Upper Egypt has a very deep-coloured Grape, yielding a dark purple juice.

#### Spanish Varieties.

*Pedro Ximenes*—stock large; bark adhering loosely—branches rather numerous, of middling length and thickness; colour, reddish grey, soft, the distance between the knots middling; secondary branches abundant; buds, large, very pointed leaves of middling size; bunches numerous, of a conical shape; ber-

ries  $5\frac{1}{2}$  lines in length, and 5 in thickness, very obtuse; the colour white and gilded. The specific gravity of the *must* of this Grape at San Lucar, after two days' exposure to the sun before pressing, was  $12\frac{1}{2}$  degrees of the hydrometric of Baume, which is equal to 1.092; and at Paxarete its *must*, after four days' exposure, weighed 16 degrees, or 1.121. This Grape rots more readily than any other variety. Its *must* is considered the most precious for sweet or dry wines of the south of Spain, but not for brandy. It is originally from Madeira and the Canaries, and was introduced two centuries ago to Malaga and Grenada, where one-half of the plants in the vineyards consist of this variety; at Xeres, one-eighth; at Matril, four-fifths; and at Paparete, one-fourth.

*Muscatel Menudo Blanco* (small white).—The stock small, and buds very early, branches numerous, of a bright reddish grey; leaves rather small, bunches few, and the berries few, of an insipid sweet taste.

*Mantua Castillan*.—The stock and trunk large, bark rather thin, branches few, of a reddish grey; leaves of a middling size, very cottony on the under side, the cotton adhering strongly; bunches large; berries 9 lines long, and  $8\frac{1}{2}$  thick, fleshy, very savoury, and fine skin. It bursts and rots if exposed to rain after it is ripe. It is chiefly cultivated in the sandy soils of Xeres, and is valued for eating.

*Uva del Reg* (white).—Stock large, branches few, bright reddish-grey, leaves rather small; bunches large and irregular, berries white, an inch long, by 10 lines in thickness, skin very fine, sweet, and rough.

*Mollar* (black).—Stock middling, branches numerous, leaves extremely short, the under surface covered with a very adhesive white cotton; bunches large, berries eight lines in length, and  $8\frac{1}{2}$  in thickness, and ripen early. At Xeres it is planted in the proportion of one-third, and at Arcost, &c., four-fifths.

*Moscatel Gardo Blanco* (large white).—Large stock, and branches of a yellow-red colour; its berries are a little gilded, and 11 lines in length, by  $9\frac{1}{2}$  in thickness. The *must* of this Grape weighs 15 degrees, or 1.114. It makes the best Malaga raisins.

*Machar Nudo*.—From this Grape is made the highly-esteemed sherry wine, or Xeres.

*Pedro Ximenes Larga* (white).—Is employed in making the Malaga raisins; berries 10 lines in length, and only  $6\frac{1}{2}$  in thickness. It is good also for wine, as well as *sun raisins*.

*Jaen* (white).—Is cultivated in almost every province in Spain. It is esteemed for making wine, and yields a large proportion of brandy. It is used for *Lepia* raisins, and is late in ripening.

*Marbelli* (white).—A good eating Grape.

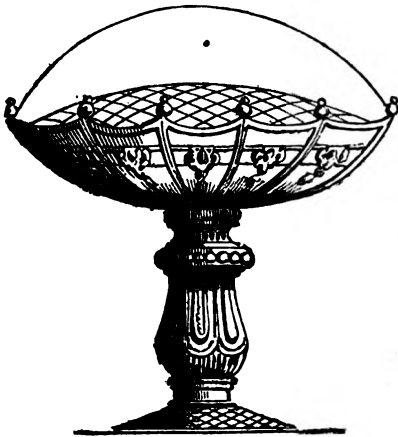
*Cabriel* (black).—Ditto, and the Grapes have fine seeds.

*Doradillo* (white).—Used for wine and *Lepia* raisins.

*Temprana* (white).—The *must* of this Grape, after three days' exposure to the sun, weighs 15 degrees, or 1·114. It furnishes a good wine, and is extensively cultivated at San Lucar, Xeres, Port St. Mary, &c.

*Luyzen* (white).—It is a good eating Grape, and of the Mantua tribe.

The other varieties are used for making of small wines in Catalonia and other parts of Spain, which are mixed with the finer qualities. The brandies of Spain are bad, and very little used in mixing for exportation.



MANAGEMENT OF CUT FLOWERS.

ALTHOUGH there are thousands fond of flowers who cannot grow them for want of convenience, there is no situation nor circumstances under which a cut flower is not acceptable, and in which it may not be preserved for a time. The love of flowers from the the single pansy to the most costly nosegay seems universal. Scarcely a desk in the city is without its single flower or its bouquet, which has been transferred from some suburban garden by the grower, or purchased of some itinerent vender by the less pretending clerk: and what drawing-room in the most smoky portion of London looks furnished in these floral times without its vase of flowers? In the preservation of these, we feel no small interest, and this is the particular reason, when some preparations for their better keeping should be made. We have already spoken of the Elizabethan vase. The simple peculiarity of which, as compared with other vases, consists in the class covering to prevent evaporation, which is the principal cause of decay, the edge of these glasses fitting into a groove or gutter,

which is filled with water. The management this gives to the lovers of flowers by preserving them a considerable time in perfection, induces those who use them to buy much more costly flowers. The sketch here given, is carrying out the principle of the Elizabethan vase to an elegant stand for a group, a wire cover to the dish which holds water, enables us to group the flowers in almost every way, the stems going through and reaching the water in the dish. Now, whether this be done on a large scale or a small one, it is equally perfect.

#### THE LATE MR. LOUDON'S WORKS.

It has been unfortunately shown, by a letter of Mrs. Loudon's which has appeared in the public prints, that the subscription in behalf of his survivors, and for the release of his works has been exceedingly partial, and that much remains to be done. To us, this appears incredible, and to the gardening world by no means creditable. When we had the honour of calling public attention to a testimonial during his life, the abundance of letters we received expressing anxiety to co-operate in any plan that could be proposed, convinced us that such testimonial would not have stopped at the inadequate sum now produced, had it been commenced as we then suggested. We are convinced the powerful appeal which appeared in the last Magazine, which by our republication reached the whole gardening community, did all that has been done yet, and therefore, must we look at the public meeting and the subsequent proceedings as a complete nullity. There were eight or ten subscribers who put down their names, and who were ready to do so when we first drew attention to the subject, and up to the fourth of March, according to a fresh appeal from the Horticultural Society just sent forward, there had not been twenty pounds added. It is not for us to say, why in such hands there should have been such a mortifying failure, when according to the reports of two meetings held at an early period, and during Mr. Loudon's life, fifty or sixty persons subscribed at once, and volunteered their services to promote subscriptions elsewhere. However, our business is not with the past, it is with the present and future. Let our readers reflect that we have lost a man whose enthusiasm and perseverance have produced us many valuable works which may hereafter make many a bookseller rich; that there are some which still belong to his surviving family, but are impounded as it were and unproductive until a certain sum can be realised to redeem them; that, however acceptable money might be, and would be from those who can give of their abundance,

that it would be yet more gratifying if those who wish for valuable information will at once, and while it may be useful, buy the works, for there are some to suit all ranks, and we may say all circumstances. Of those which are Mrs. Loudon's property, and the purchase of which will serve the cause, we call attention to the following:—

**THE ARBORETUM BRITANNICUM**, 8 vols.  
**REPTON'S LANDSCAPE GARDENING.**

**ENCYCLOPEDIA OF TREES AND SHRUBS**, being an abridgement of the *Arboretum Britannicum*.

**THE SUBURBAN HORTICULTURIST**,  
**THE SUBURBAN GARDENER AND VILLA COMPANION**

**THE GARDENER'S MAGAZINE** from 1835 to 1842, at the publishing price of which a single number, a single volume, or the whole may be had, and of which every volume is complete in itself.

To any one or more or all of these works do we solicit the prompt attention of our readers; we do not approve of all Mr. Loudon's works nor all his opinions, but we do unhesitatingly say that these are not only unexceptionable but also valuable, and that the Horticultural world owes a debt which can only be properly paid by an extensive patronage of those identical works, the property of the widow, but involved to such an extent as to require the sale of many copies to redeem them. Let us also impress upon the mind of our readers who intend to purchase, and we hope there will be many, that the most effectual way of doing this act of justice will be to send post-office orders direct to Mrs. Loudon at Bayswater, payable to her, and enclosing direction where the books are to be sent. We unconsciously have caused several copies of the works to be purchased of booksellers, and the entire profit has been lost to the family.

#### BENEVOLENT SOCIETY.

THE time has come when the Benevolent Society ought to make great advances, and when the gardeners themselves ought to stir in its behalf, and we are recommended by a number of correspondents to say that nothing could be more rational, more creditable, or more beneficial than the establishment of an annual exhibition for its exclusive benefit; when we observe that twelve thousand people have been got together for the mere purpose of seeing flowers, and one another at a cost of five shillings each, we take leave to suggest the propriety of trying one at half the money. Let this take place on the 13th of August, the birth-day of her present Majesty, let the prizes be nominal, that is to say, let

there be a medal of very moderate value indeed, on which an amount shall be engraved, and let the winners of prizes be inserted in the list of donors as subscribers to that amount, with all the privileges attached thereto. August is a month in which dahlias can be produced, and when an exhibition will be in the way of no other. It is true, that thousands are then out of town, but it is also true that the thousands who are not yet out of town, having no great opportunity of amusing themselves, are ready to patronize any laudable attempt to blend entertainment with benevolence. We would have the prizes liberal as those at any other show; the actual medal delivered may not cost more than ten shillings, but it should contain a certificate that the holder had been awarded a prize, value £ which he had contributed to the funds of the Benevolent Society. We earnestly press this upon the attention of all those who are concerned for the welfare of the Society: we do not see a single objection, because it would be a poor concern indeed which would not afford prizes, and the value of these would be simply handed over to the benevolent in the names of the winners, as if they had subscribed as much without the show. By these means it is not improbable £500 per annum may be added to the funds, because independent of the amount of the prizes, if there were any exertion at all there must be a large profit. Once more we impress this subject on the general attention of gardeners and amateurs, before they pledge themselves to run after other charitable societies. Charity begins at home, and before a gardener with a sort of charitable knight errantry hawks about his plants for other trades, he ought to consider the hundreds of deserving suffering men of his own class. If there were no other place to show in, one might borrow for a day the middle row of Covent Garden Market; the Lowther Arcade, or the Baker-street Bazaar. We will place this at once upon a footing in which it can be carried out in a small way. Let those gardeners and employers, amateurs, and nurserymen who are willing to show for such a purpose, communicate at once their intention. If enough will join, the plan shall be simple:—Take a scale of prizes that shall make the head prize in every thing be ten guineas, the amount of a life subscription, and others be in proportion, not less than ten prizes in every class of a general nature; let the place of show be chosen where economy shall be studied as well as effect, in short let every thing be done carefully and judiciously, and we will suppose by way of looking on the worst side of the thing, that after all expenses were paid there remained only fifty pounds to

pay £100 worth of prizes. The value of every body's prize would be only half, or if there only remained twenty-five, the value of every body's prize would be only a quarter, still that quarter would be paid to the society as his contribution, and the funds be so much improved. There might be another mode of carrying this into effect, for the month being one in which no public society holds its show in the metropolis, the proprietor of the Surrey Zoological Gardens might be applied to for a day's show there, at 2s. 6d. instead of one shilling, and he might perhaps meet the object as he always did meet any thing of the kind liberally. Suppose for instance he would give £100 for prizes and take all risk, this would be all profit and go into the Society's funds at once, the show merely deciding in whose names it should be paid, or if twenty gentlemen would guarantee a given sum to the proprietor for the entire proceeds at the gate, the proprietor reserving the galleries. In short, if a certain number willing to exhibit will signify their intention, we will soon submit a plan that would be acceptable to all, and thus place the funds of the society in a fair way of attaining a large annual increase. Report says, that Mr. Gye and M. Jullien will open Vauxhall; there have been good shows there and might be again, but it behoves every one who is willing to lend a hand to speak out at once, and every body who can put his shoulder to the wheel, to recollect but that a simultaneous effort would move a rock. We trust this will be understood by the large class of amateurs, who patronize this work as well as by the practical gardeners and nurserymen, for it is a subject worthy of their attention, and needs no other appeal, that the mere statement of the fact, that hundreds of decayed gardeners and their widows are in want in their old age.

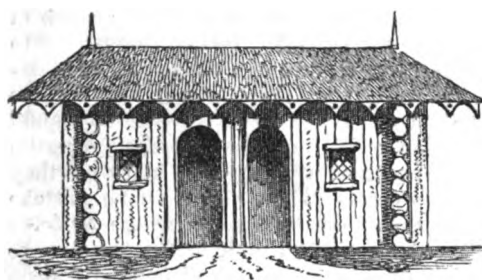
#### JUDGES AT SHOWS.

THE difficulty of judging accurately at Floral exhibitions has occupied the attention of many very excellent men, and there is no immediate remedy for it; but much may be done by adopting rules and regulations, and by enforcing them. The following strike us as being absolutely necessary. First, nobody should be permitted to exhibit at all, unless notice be given of his intention, and of the subjects he intends to produce. Secondly, all subjects in competition should be placed together, which can only be done by the managers knowing previously what there is to place; hence the necessity of notice. Thirdly, the judges ought not to have too many subjects to judge; and, wherever it is practicable, the exhibitors themselves should have

the privilege of choosing them, because it takes the responsibility from the managers, and the exhibitors are better satisfied. Fourthly, the judges should not be hurried, but have ample time to go over the merits of every plant or flower. Fifthly, the exhibitors should know what they are going to show for—that is, whether for skill, for beauty, or for rarity; because, unless they know this, we shall find one collection rare, but not showy; another collection showy, but not rare; and a third remarkable for the good growth of difficult plants. All this perplexes a judge much. One, would give rarity the preference; another, would be taken by the brilliance; while a third, looking to the encouragement of horticultural skill, would give it to the gardener who had shown most merit in the growth of difficult plants. All this is calculated to confuse the judges and disappoint the exhibitor, because they naturally all look for the head prize. The circulars to exhibitors should therefore point out what are the properties looked upon most favourably, and what they are to expect. There should be no mistake about the qualities required by the Society; there is a good deal to do before this can be accomplished, and we are of opinion that no plan has approached the right one so nearly as the Royal Society's plan of 1838. The idea of rewarding *all that deserve it in the way they deserve it*, is a good one. It does away with competition, the plan of making first, second, and third prizes should be abandoned. It leads to endless comparisons and squabbles; it generates much jealousy; it causes prizes to be given where they are not deserved; and in consequence, men, who only obtain what they have fairly won, begin comparing their case with the less deserving. It is impossible; honestly, to withhold prizes which are to be given for the best, if any are shown, without acting dishonourably; and when prizes are unconditionally given to the best, it may happen the very unworthy subjects take them. The Horticultural Society have a saving clause, by which they can withhold any prize without assigning a reason. This is objectionable, because whether a thing is or is not worthy of a prize, depends, we fear, mainly upon *who* it is, and not *what* it is, to be awarded for. The best plan is that of giving prizes for everything deserving, no matter how many competitors, and to give no prize whatever if the production be either *bad*, or *merely common-place*. It leads at once to this desirable result, men who know their productions are only middling good, will not run the risk of bringing them, and thus all that is shown is fine.

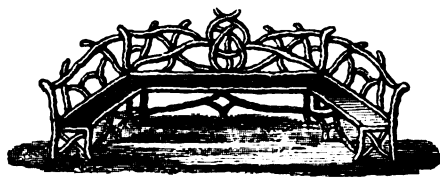
A man then knows that it is no use taking things upon the chance of there being no other

competitor. The great mischief at present is, that among a great mass of plants, so very few are above the average, and it must be pretty clear that the idea of rewarding gardeners or amateurs for things of common growth, is downright bad; people who merely want to make a show of common things, could get nurserymen to supply plants at less price than the prizes for such a quality would amount to; so that things of ordinary growth should under no circumstances be entitled to prizes. Then these things of extraordinary growth which are in fact the only attraction at a show, would be better encouraged. These hints are thrown out for the benefit of those who are drawing up their schemes for the year.



RUSTIC SEATS.

RUSTIC SEATS and Rustic Out-houses are legitimate ornaments in a garden, and here we have a specimen of each. The design at the top is of sufficient importance for a Lodge or Gardener's Cottage, and its appearance in a suitable spot would be highly ornamental. The seat is appropriate to any nook among the boundary plantations, and might be either on a large or small scale.



OXALIS DEPPEI,

A CULINARY PLANT, BY R. THOMPSON.

AN article on the *Oxalis Deppei*, by Professor Morren, of Liège, having appeared in the "Gardener's Chronicle," vol. I., p. 68, attention was directed to its cultivation in the garden of the society; the mode of culture recommended by Professor Morren being adopted in the first instance. The results of this, and of other modes subsequently tried, leave no doubt respecting the facility with which this real accession to the list of culinary

vegetables can be successfully cultivated, so as to furnish an abundant supply. It was necessary that this fact should be well ascertained, because another species of the same genus, *Oxalis crenata*, has not realized the expectations entertained respecting it.

*Oxalis Deppei* was first introduced into this country from Mexico in 1827; and was named by Messrs. Loddiges in their *Botanical Cabinet*, No. 1500. Subsequently M. Lejeune gave it the name of *Oxalis zonata*, "in order to express the black bands of the leaf;" and M. Henon published some information concerning it in the year 1838.\*

The uses of this *Oxalis* in Belgium are enumerated by Professor Morren. He states "that if cut longitudinally the root is found to have a firm transparent rind, the tissue of which resembles that of salep; like it, it becomes white in drying, is transparent, and consists of cells enclosing a very nutritious substance. The young leaves are dressed like sorrel, in soup or as a vegetable; they have a fresh and agreeable acid, especially in spring. The flowers are excellent in salad, alone or mixed with corn salad, endive of both kinds, red cabbage, beet-root, and even with the petals of the dahlia, which are delicious when thus employed. When served at table, the flowers with their pink corolla, green calyx, yellow stripes, and little stamens produce a very pretty effect. The roots, after having been washed and slightly peeled, are gently boiled with salt and water. They are then eaten like asparagus in the Flemish fashion, with melted butter and the yolk of eggs. They are also served up like scorzonera and endive, with white sauce. They form, in whatever way they are dressed, a tender, succulent dish, easy to digest, and agreeing with the most delicate stomach. The analogy of the root with salep indicates that its effects should be excellent upon all constitutions.

The plant consists of a tapering, white, semi-transparent tap-root of tender substance; furnished, chiefly at and near the lower extremity, with hair-like fibres, a few of which also proceed from the sides. The centre is generally more or less hollow, with the medullary substance adhering in variously fissured portions. The roots in this case are not however in other respects unsound. Sometimes, from rapid absorption, clefts are formed externally; but this will probably be of rare occurrence under favourable circumstances of soil and climate.

On the top of the crown a mass of scaly bulbs appears; their scales are lined and fringed with orange-brown silky hairs. By means of these buds the plants can be easily

\* Notice sur l'*Oxalide* de Deppe. 8vo. Lyons, 1838.



and abundantly multiplied. The leaf-stalks are from nine inches to a foot or more in length, supporting four inversely heart-shaped leaflets; each having a dark coloured band across its centre; these bands are somewhat curved, so that when the four leaflets are arranged in a flat equidistant manner, a tolerably perfect dark circle is formed. The flowers are of a bright rose colour, and are supported on erect scapes above the leaves.

Professor Morren states that *Oxalis Deppei* "will not thrive in loam, still less in calcareous earth; that it always suffers in heavy land, and often will not produce its tap-roots; but in a sandy soil, light, and mixed with decayed vegetable matter, the plant acquires a large size. The aspect in which it is grown is immaterial, although a southern exposure is to be preferred when not dry." He plants the bulbs on the 15th of April, when he no longer fears frost, an inch deep and five inches apart, in rows which are seven inches asunder. Three or four are put into the same hole, taking care to arrange them in quincunx. The beds are kept clean and in the month of May are watered with liquid cow-dung. As has been already observed, the above mode was adopted in the society's garden; but it has been found that the plants do better when the bulbs are planted, singly, six inches apart, in rows a foot asunder.

The soil in the society's garden is not naturally well adapted for the growth of some tap-rooted vegetable; the carrot in particular may be instanced as never producing very fine roots in the usual way of cultivation. This being the case, holes are sometimes made and filled with prepared soil for this crop, in order to encourage the tap roots to extend downwards without subdivision. A similar plan was tried with the *Oxalis*, and found to answer better than where the whole bed was composed of prepared soil; and the expense was of course comparatively little.†

The bulbs were planted about the middle of April, so shallow as to admit of their being just covered; for thus they occupy a position with regard to the surface similar to that in which they are produced, and this seems indispensable if fine sorts are to be obtained. They have been observed, indeed, to spring up from a considerable depth; but in this case tap-roots were not formed.

During summer the soil must be kept moist in dry weather; otherwise, when rain falls abundantly, the sudden accession of water to the roots occasions their splitting. The plants

should be allowed to grow as long as there is no danger from frost; but previously to this occurring, they should either be taken up or protected. If protected from frost, by frames, or otherwise, the roots will continue to increase in size till November. When taken up, the roots should be divested of the numerous bulbs formed on their crowns, and then stored up for use in a cool dry place, but secure from frost. A similar situation will be proper for the bulbs; or they may be kept in dry sand till the season of planting.

Mr. Cockburn, gardener to the Earl of Mansfield, at Caen Wood, Hampstead, grows this plant in perfection with no particular preparation of soil; merely plunging the bulbs in shallow drills, a foot apart, in borders dug and manured as for other kitchen-garden crops. He also plants it by the sides of walks in the woods, as an ornamental plant.

We have in our gardens another *Oxalis*, apparently the *O. Jacquini*, which also produces tap-roots like those of *O. Deppei*; but they are much smaller, and inferior in quality. That species is readily known by its flowers being very small and of a pale lilac colour.—*Horticultural Transactions*.

#### DISEASES OF PLANTS.

UPON this subject there are some very long articles in the *Chronicle*, from which we have abridged the following:—

The exciting causes of Disease in Plants are the increase, decrease, or alteration of the various external agents by which their life is maintained; these agents are light, heat, electricity, air, water, and the soil. In a state of nature the constitution of plants is adapted to the distribution of these agents on the globe; but when plants become cultivated, their natural relation to these agents is disturbed; and, like civilised man and domesticated animals, they become the subjects of disease. Diseases may arise from a complication of causes, and not simply from the too great or too little influence of one of the agents. Thus the deprivation of heat may act on plants growing on a bad soil, when it would not on those growing on a good one. Frost, or the deprivation of heat takes the greatest effect on good soil, we have seen six acres of Broccoli on one of the best pieces of land round London cut off to a plant, while the same sort on poor bad soil in the same neighbourhood have hardly been affected.

The influence of *light* is very great on the healthy growth of plants; it acts as a stimulant, and by its agency the peculiar secretions of plants are almost entirely developed. When deprived of it, what is called *blanching* takes

† The plant from which the accompanying figure was made was grown by this method. It would have doubtless been even finer had the summer been more congenial.

place. This is a Disease of the Plant, though purposely had recourse to in many gardening operations. [This we presume to dispute, Celery is blanched to the extent of three-fourths of its whole quantity, yet it is as healthy as when not blanched; and many plants, such as Tulips may be blanched until the stem underground that would not be two inches, is twelve inches, yet the plant may be in full health and vigour. Plants may be blanched till they are diseased, but when all the functions of the plant, even to fruit bearing, are carried on with three-fourths of it in the state alluded to, it is too much to call it disease. Its effect is constantly produced to a greater or less extent on plants grown in this country which are natives of tropical climates, and it often lays the foundation of other Diseases. Disease may also occur from excess of light, where plants growing naturally in dark shady situations are exposed to its influence.]

*Temperature* has a more obvious influence on the health of plants than light. The Diseases produced by a low temperature are very numerous, and there is no agent that plants will bear the diminution of so little as heat. Much depends on the circumstances of the plants. After the buds have expanded, the parts of the plant appear to bear cold better, the older they are. Frosts often deprive the stamens and pistils of flowers of their functions, and unfruitfulness is the result; [Will the writer venture to say that a tree will not bear fruit if the pistil be not impregnated at all? For this is the case when the apple has no pips, the peach and plum no kernel. It is only when the pistil is decayed that there is not fruit.] *Plants never get injured to cold for their structure does not appear to possess the adaptability of animals;* and consequently, when brought from climates where the average temperature is higher than our own, they are sure, at one time or another, to suffer. Excess of heat frequently produces Disease, although its consequences are very slight compared with those of cold. Sudden changes from hot to cold affect the secretions of plants, and to this cause honey-dew is most frequently to be attributed.

A due supply of *water* in the form of vapour in the atmosphere, and liquid in the soil, is necessary to most plants; but when either in too large or too small quantities, it is the cause of disease. Anasarca, or dropsy, occurs where there is too much moisture in the air; and the excessive development of hairs on particular parts of the plant is a consequence of dry air. When in too large quantities in the soil, canker, a premature falling of the leaves, and other diseases, are the consequence. Wither-

ing, and also a falling off of the leaves, is the consequence of too little water.

What influence the composition of the *soil* has on particular Diseases of Plants we are not in a position to state.

Through the medium of the soil and air, various poisonous agents are introduced to plants. From this cause arise important effects requiring investigation. The precise influence of carburetted hydrogen, chlorine, sulphurous acid, and the gasses in the air, is not known; and in the neighbourhood of towns a variety of injurious ingredients get into the soil which are destructive to vegetation. (Equally anxious for information, we will conclude in the words, of our contemporary, and say.)

"We shall be glad of any communication on the subject of the treatment of diseases of plants, and hope our correspondents will remember that unsuccessful cases are equally valuable with successful ones."

#### GARDENS IN DECAY.

It is impossible too strongly to impress on the minds of those who possess estates, and property to uphold them, that nothing looks so desolate, so poverty-stricken, and so miserable, as a domain in slovenly disorder; and that nothing bespeaks substance, good taste, and benevolence, so completely, as an estate in fine condition. In the one case you observe the domain slovenly at the very entrance, the roads out of order, and perhaps choked with grass; the trees broken; the herbage foul. As you proceed, the irregularity of the trees, and the manner of their growth, betrays neglect. Nearing the mansion, the shrubberies are overgrown, the paths coarse and mossy, the limits of the borders and clumps no longer visible; the shrubs straggling, and the lawn like a foul meadow. These are symptoms of that kind of neglect which saves the wages of half a score of men, and deprives many families of comfortable permanent employment. See the picture reversed; and enter upon an estate well kept up. Every yard you tread seems over different ground; the road is in good order, the shrubberies clean and well shaped: the grass short and smooth; not an ugly tree in sight; an air of neatness pervades the whole scene. If the grounds which are in order be but one half the size, and the mansion not half so important, the one looks like wealth and comfort, the other like pride and poverty. Who can for an instant reconcile themselves to the possession of estates which they are too poor or too parsimonious to keep up? None but persons ignorant of all the means of enjoyment in the country, and per-

fectly indifferent to all that is due to house, land, and labourers. A large concern neglected is discreditable to the owner. As soon as a man cannot do justice to the grounds round his mansion, he should let them to some one who will. It is impossible to conceive a more painful sight than a noble place going to decay; the owner must be pited or condemned—pited if willing and unable; condemned if able and unwilling; and none who can help it, and see the consequences, will willingly place themselves in this situation. Yet there are, and we blush while we write it, hundreds of estates in the hands of people who can afford to keep them up, but who, to save the money they would have to pay among the labourers in the neighbourhood, absolutely let everything go to ruin and decay. These people “save at the spiggot, and lose at the bung-hole;” for while they save two or three hundred per annum by neglecting the place, they deteriorate its beauty, its character, and its value, infinitely more than all they save; besides which, they are considered in the eyes of the world slovenly and selfish; and every labouring man within miles will feel (and sometimes speak as he feels), that such people are no friends to the working classes.

#### THE THEORY OF ACCLIMATISING PLANTS.

WE say “the theory,” because we deny that there exists a power of changing the constitution of a plant by any means, though it has been thought by eminent men that it can be done, and has been done, for when we enjoyed a succession of mild winters up to the bitter frost bespoke by our friend Mr. Murphy, people would show plants which they boasted had stood out for years, and as they remained uninjured, they were considered naturalised. When plants are received from warm climates, nothing is more natural than to put them in a stove, but this affords no proof that they will not live and do well in a greenhouse, or that it would not stand a moderate frost; but we should in such case find that the first day it was received it would have stood as well as it would after three or four years pretended hardening. It is not that a plant better bears the frost, but that a plant supposed to be tender is discovered to be less so. We remember a prize being offered by Mr. Barclay, of Sunbury, for the best approach to acclimatising made after the time it was announced; and on that occasion we recommended a young friend of ours to begin with the potato, reminding him that it stood the frost no better now than it did twenty years ago, and therefore if he could make that bear freezing, he would have accomplished something that all the other persons who had

tried had failed in. We own the advantage which would arise from rendering tender plants hardy, if ever such feat could be accomplished; but we confess our want of faith in the slightest alteration or advance towards it. It is quite possible that seedlings may be obtained occasionally hardier than the parent. It is in this way that one kind of potato stands better than another. The Dahlia is no more hardy than the year it came over, and for aught that yet appears to the contrary, there is the same impatience of frost among the very newest seedlings. We could mention many subjects that are only the same now as they were twenty years ago, and will remain so for twenty years to come. But we can conceive that, by taking particular notice of seedlings of tender plants, and every year saving seed from that which seems to stand the frost best or longest, it is possible there might be in time some of a hardier nature produced, though we think it unlikely that any useful approximation could be accomplished. But the case is not so where there already exists hardy plants of the same family: for instance *Rhododendrons*, although a true *arboreum*, may be played tricks with for a century, it would still be as tender as now. But, fertilise the hardy one with the pollen of a tender one, and you may obtain a hybrid with the beauty of the one, and the hardy nature of the other. This, however, is not what was contemplated in the notion of acclimatising plants, which means nothing more or less than, by management, so gradually inuring them to cold as to render them permanently more hardy;—about as successful an attempt as the poor fellow who had, by reducing his horse's food a little every day, at last brought him to eat nothing; but the day after he had accomplished his grand work, the poor horse died. So it is with plants: a man may play tricks, and fancy he has something that will stand the frost; but just as he deems he has accomplished the task, the plant is found dead.

Let it not be supposed that we deny the possibility of two plants of the same kind being very different in their capacity to stand frost, because this we see every day. A plant with its wood well ripened, will stand frost better than one with all the young growth upon it; and again, a plant which has received a check, will stand better than one in full growth. But these characteristics have nothing whatever to do with acclimatising. Upon the whole we may sum up thus: we deny that any given plant can be made to bear more degrees of frost, with five years management of any kind, than one that has been equally well grown and ripened a single season. We admit the possibility of seedlings

being accidentally produced a trifle more hardy than the parent; and we know and see daily that plants of a hardy quality, fertilised with the pollen of a tender one, may produce hardy plants of great resemblance to the tender parent; beyond this our notions of acclimatising do not reach, for we have many proofs before us, that the first time the right degree of frost actually catches it, all the acclimatising goes for nought. We have been led to this discussion by a glance (for we are often looking through the work), at Captain Mangles' splendid little "Floral Calendar," where there is a quotation from "Paxton's Botany," that will astonish others as it has astonished us. Captain Mangles, we should have premised, has, in his Calendar, besides giving a mass of valuable information, selected a few subjects from other works, which presented either curious facts or interesting instructions. The quotation is from No. XLIX., and by a correspondent, who writes thus:—

"Having for the last ten years introduced to the pleasure-ground such of my New Holland plants as I judged most ornamental, it may not prove uninteresting to notice *my mode* of enabling them to *resist the winter*. I prefer the month of March to any other, making sure that vegetation will not take place before they are placed out. I then support each plant with four or five stakes, reaching to the top in an angular position. Thus surrounding them from bottom to top with hay ropes not too close, I then cover the surface for several feet round with fine sand to prevent the frost from entering. Having succeeded in this way the first winter, **THEY FEARLESSLY ENCOUNTER EVERY SUCCEEDING ONE, and can vie with common laurel.**"—

If we call *protecting a thing from frost* making it *stand frost*, as is the case when the frost is not permitted to enter, why it is something new in logic, and as to the fact of keeping the frost from entering the first winter, making a plant fearlessly encounter every succeeding one, a monosyllable would describe best the writer's character of the operation. — *It is not true*; and how a man of Mr. Paxton's experience could be imposed upon, seems to us incomprehensible. The mistake people make is this, they find a plant succeed out of doors for a winter or two, and fancy they have discovered a mode of acclimatising, relate with great minuteness how they treated the subject, and set other people doing the same thing. A harder frost than usual, or a frost under other circumstances of wet or wind, or otherwise kills the plant, and all the good that is done by such stuff is to cause others to lose plants as well as the writer, who has merely had his plant in a warmer situation than

others that have been killed before it, and imagined that his treatment instead of the natural shelter of the spot had affected the supposed hardness.

#### EFFECTS OF CAMPHOR ON CUT FLOWERS.

THE stimulant effects of camphor upon the human and some other animal bodies are well known; but those on vegetables are not only new, but astonishing in their nature. A piece of the woody stem of the tulip-tree, with one flower and two leaves, taken out of a pot of water, containing several other flowers of the same plant, all, to appearance, in the same state, was placed in eight ounces of water, which had been stirred up for some time with one scruple of good camphor. In a little while an unusually lively appearance became remarkable in the flower in the camphor; while the others, though they had the benefit of a larger quantity of water, were sensibly drooping. The two leaves first elevated themselves considerably on their footstalks; the flower expanded more than in a natural state; the stamina ovaries receded from the pistillum; and the three leaves of the calyx, or flower-cup, were remarkably reflected back, and grew extremely rigid and elastic. The internal surface of the petals of the flower perspired considerably, though a similar perspiration could not be perceived in the flowers of the same plant, in the same room and temperature. The camphorated plant continued in a very invigorated state for two whole days, after which it began to droop; but the leaves drooped and decayed sooner than the flower. The other flowers and leaves of the tulip-tree left in simple water, did not live more than half as long as that in the water impregnated with camphor. Notwithstanding these surprising effects, no odour of camphor could be traced in any part of the branch, except what was immersed in the fluid. This circumstance seems to render it probable that the camphor was not absorbed by the plant, but that it exerted its remarkable influence entirely through the solids to which it was immediately applied. The appearance, however, was very striking, and might be compared to the beneficial effects of opium on the human constitution. Several other experiments were made with camphor on plants, in all of which it was very evident that camphor operated as a powerful and wholesome stimulant. A stalk of yellow iris, with one expanded flower, was taken out of a phial of water, in which it had been placed more than a day. The flower had begun to droop; but, in a very few minutes after being put in a phial of the same size, containing a few grains

of camphor, it began to revive, and continued in a vigorous state for many hours. As camphor is but very sparingly soluble in water, it is natural to conclude that the stimulant effects were produced by a very small part of the quantity mingled with the water. This discovery might induce us to make experiments with camphor as a manure, if the expense of trying them on a scale sufficiently large were not excessive. But still, we may apply the camphor in the manner before mentioned; and can that be termed a useless purpose? A few grains of camphor, acting as a cordial, will revive a drooping plant, increase its beauty, and prolong its existence. In the eye of a florist, these are objects of no mean importance.

This observation is given on the authority of Burt's observations on the curiosities of nature, and may be accurate, but the experiment is so easily tried on common flowers, that every body should try for himself in as many ways as are available to him. We remember well, however, seeing a gentleman from a distance unpack a box of carnations and picotees which looked shrivelled and bad; all we heard from him at the time was that he had "put too much," and afterwards, while bewailing his fate, "I have made it too strong." From these we gathered that he had mixed something with the water in which the flowers were placed for travelling, but what that something was we heard from a third person, who seemed to rejoice at the failure, and who informed us it was nitre; we were then assured that a little nitre was a very good thing for flowers that had to be kept long after they were cut. We confess our ignorance of these things, having always found plain water sufficient for our purpose; but, if anything half so advantageous as is pointed out in this paper be found, for the use of those who travel far with flowers, it will be of great service. All we recommend is that people satisfy themselves by actual and repeated experiments before they venture to adopt it with their show flowers, for every bloom is an object on the day of exhibition, and nothing should induce them to run the risk of spoiling one in their endeavours to improve it.

#### ON THE MANAGEMENT OF SEEDLING PELARGONIUMS.—By Jas. Heriot.

It may seem presumptuous to say any thing on a subject which you will doubtless consider much better understood in your neighbourhood than it possibly can be here, but when last in London I enquired of one of the leading nurserymen how long he took to flower his seedling Pelargoniums, and he said *two years*. I

am aware, however, that this is now done in less time, but as my mode of treatment originated from my own ideas, and as that plan is a very simple one, and easily practised by any person who has the same conveniences, I think it may be useful to Pelargonium growers to be made acquainted with it. I sow whatever seed is ripe in July, immediately upon its being gathered, and of course take the seed from the handsomest showy Pelargoniums which I have impregnated. The seedling plants very soon make their appearance, and when about a fortnight old or when they have shown either two or four leaves besides the seed leaves, I pot them in small 60 pots, about this time fire is put on in the vinery, in order to ripen the wood of the vines, and I put these plants in it, and they are kept there for some time, being merely put back into the greenhouse in time to harden them before the winter sets in, I used to put them on the front shelf of the greenhouse close to the glass, but one season a severe frost setting in in October I lost a good many plants, I now, therefore, place them on the front flue, where they are perfectly safe, and where they remain until about the third week of February, when fire is again put on in the vinery, the young plants are then removed to the vinery and where they remain for about a month or six weeks, and during which time they are shifted into larger pots, chiefly 32s., there is no doubt they might be potted in smaller pots, but my reason for over potting them is with a view to their subsequent management, while it saves any extra trouble. As soon as they are fairly established in their pots, they are removed back to the greenhouse in order to be hardened preparatory to their being planted out. In the first week of June, which is as early as they can be planted out in this part of the country with safety, they are planted out *in their pots*, in the open border, the top of the pots are placed about an inch below the surface of the bed, this of course saves watering, for occasional watering will at times be necessary, as with other greenhouse plants which are planted out, and there they remain during the summer. About the middle or end of September, the pots are taken up and removed to the greenhouse. They have by this mode of treatment become strong plants, and they sustain no check by then remaining in their pots. The protection now given them by the greenhouse brings them into flower, and the greater part of them flower in the course of the month of October or the beginning of November the remainder of them flower early in spring. The bad seedlings are of course thrown away, the good ones retained. By the above simple management the greater part of the seedlings are

flowered within fourteen or fifteen months from the time of their being sown, and it requires no argument to prove the validity of this to the Petargoniums grower, to ascertain the quality of his seedlings in so short a space of time, and although the forcing may have somewhat drawn the plants, I consider they are of less importance. Any seeds gathered after the first of August may be kept unsown until the following spring, and by adopting a similar mode of treatment, the seedlings sown in spring, will be generally brought into flower in the course of the second summer or about fifteen or sixteen months after the seed has been sown. There is nothing very particular in the soil employed, that which I use is one half leaf mould, and the other half partly light mould, with a small mixture of sand, I give no more of any kind, which would probably make the foliage more luxuriant and throw back the flowering. The treatment is simple, and will, I have no doubt, answer in most situations.

#### ON THE MANAGEMENT OF SEEDS SENT ABROAD.

It may be useful to some of your readers to know the best mode of sending seeds which are ordered from abroad. It was some time ago usual when seeds, chiefly garden seeds, were ordered from abroad, to send them packed in tin cases, as best fitted to keep them from the admission of the external air; but it has been found that that mode of package did not answer, the package, say for the East Indies, having to pass through a variety of climates, being stowed in the hold of the ship, and the tin case being rather a conductor of heat, the exudation from the seeds being confined, promoted their destruction. On arrival the seeds were found to be very much injured, it therefore appears that such seeds should be wrapped in strong coarse brown paper, which will help to absorb any moisture given out by the seeds, and the whole should then be placed in a common wooden box, this mode of treatment is found to conduce much to the safe keeping of the seeds at their place of destination, and is in general suited to the greater number of the seeds ordered from abroad.—*Jas. Heriot.*

#### INGA HARRISII.

WE take the following description from the *Florists' Journal*, which is, this month, exceedingly interesting.

The extensive, varied, and very important group of plants, collected into the natural order Leguminosæ, does not contain, in our

opinion, a more delicately beautiful object than the one we have now the pleasure of noticing, our inducement to which is to be attributed to its individual loveliness, and the accomodating character of the genus. This particular species, however, is one which certainly deserves far more attention from all who delight in floral beauties than it appears to have met. It is a plant of the most easy culture, apparently capable of being made all that can be desired of a winter flowering plant; the habit is free and vigorous, the foliage neat and pleasing, and the flowers more abundantly produced and beautiful. Our figure, which is but a small sprig taken from a plant in the collection of J. H. Schroder, Esq., of Brixton, can convey but a faint idea of the appearance of a well-grown plant, from four to five feet in height, and nearly as much in diameter, when covered, as it may be had, with its very specious inflorescence. Its history appears to be involved in obscurity: no authentic information of its introduction, or from whence obtained, being preserved, the special name was adopted in compliment to — Harrison, Esq., of Kingsbury; and we are indebted to Mr. Beaton, of Shrubland Park, Ipswich, who had the plant under his charge at Kingsbury, for the subjoined account of it. "The *Inga Harrisii* is, indeed, a fine plant, which only requires the stove when in a growing state, and, as it flowers on the last year's wood, requires to be well cut in after blooming. The history of its introduction is lost. Mr. Harris bought it of Messrs. Lee, of Hammersmith, and unfortunately passed it as a new introduction to Dr. Lindley, when it flowered; it is figured in the Bot. Reg. as such; but I believe it to have been in the country for the last twenty years. Doubtless it is from the more temperate parts of tropical America. It strikes with great freedom, and like many of the same order of plants, if subjected to a high temperature after its growth is finished, is immediately attacked by the red spider. It is one of those accomodating plants that may be treated so as to have in flower for a long time in succession: say to be partially dried and set to rest by the middle or end of July, and after three months to be brought into a forcing house in succession, when it may be had in flower from Christmas to April; but treated in the ordinary way, it always flowers from the middle of January to the middle of February.—D. BEATON." It seems to delight in an open moist soil, such as a mixture of peat and leaf mould in about equal quantities, and attention to pruning, as recommended by Mr. B., is particularly necessary, or it will soon become unsightly. The entire genus consists of above thirty species, the geographical dis-



tribution of which is very wide; but all of them partaking, more or less, of the character of tropical plants. They are mostly pretty; but none that we are acquainted with equal to our present subject. *Inga* is included in class Polygamia, and order Monœcia, of Linnaeus, and in the grand order Leguminosæ, of

the natural system. The flower as figured in the *Florists' Journal*, is one of those bottle brush looking blossoms, scarlet with yellow tops, and appears a very striking subject. In fact, it was its remarkable brightness that took our fancy, and induced us to transfer the original notice to our columns.



### HABROTHAMNUS FASCICULATUS.

THE above is a representation of a sprig, the natural size, the plant forming an elegant bushy shrub five feet high. It has been raised by Van Houtte, nurseryman, of Ghent. Mr. Hartwig in his journey from El Banco to the village of San Cornelio, saw the shrub but could not procure seeds; and the figure which has been published in the Horticultural Transactions, is made partly from a dried specimen and partly from a fresh specimen communicated by the raiser. The flowers are a vivid scarlet, and the subject will be naturally looked for with great interest by the lovers of exotics in this country. The figure in the Horticultural Transactions is not on a large scale, but takes in a good deal more of the branch, and Mr. Hartwig's notice of it is as fol-

lows:—"At every step there is some change, the noble *Tree fern* (*Cyathea mexicana*) makes its appearance there; *Lopezia lineata*, *Alstonia ciliata*, *Lophospermum scandens*, *Cobæa stipularis*, *Gaultheria nitida*, were all in full flower. It was in company with those that I found the noble *Habrothamnus fasciculatus* of *Schlechtendahl*, the seeds of which I was unable to procure; it was a very fine shrub, about five feet high. It has since been raised in Belgium, and a fresh specimen in flower, communicated by Mr. Van Houtte, nurseryman, of Ghent, has furnished with the assistance of one of my dried specimens, the means of preparing the accompanying figure of one of the gayest plants of the Mexican Flora."

## GLENNY'S GARDEN PRACTICE.

## KITCHEN GARDEN.—MAY.

**KIDNEY BEANS.**—Plant your principal crop; that is to say if you profess to grow a larger supply one month than another, this is the proper month to do it in. I have already directed how they are to be done.

**SCARLET RUNNERS.**—Plant these at the commencement of the month wherever they will be most useful as a screen, or most out of the way, for they are tall growers. If you consume many beans, there are none so rich, so long in bearing, or so easily gathered as this; and although they are often planted to run up strings against a wall, or building, or ugly fence to hide it, they are never so good, so prolific, nor so rapid in growth as when a row is grown in the open space of a garden, and stuck with tall bushy sticks; plant four inches apart in the row, and if more rows than one, three to four feet asunder. There is a kind of dwarf French bean used by the foreigners for haricos, and I believe are called so, but any of the white kidney beans answer the purpose; it is well to have a crop of them, for they make an excellent stew when dried, therefore, there is no harm in allowing a quantity to go to seed; the dun coloured and speckled, though good bearers, are not fit for this purpose.

**ASPARAGUS** beds will now be fit to supply the table, and if I could persuade the consumers to never cut an inch below the surface, nor take a single head till it was four inches high, I think they would fancy their own much better than they had ever eat from market, for instead of there being a long white stem and a purple tip, they would have an inch of white, and a green wholesome-looking vegetable, nearly all of which is eatable, tender, and of fine flavour. I have adopted this plan for my own eating, but a gardener must not do so without orders, as his employer expects to see his own Asparagus something like that which he sees at a large price in the market. If they are to be cut in the usual way, when they are about two inches out of ground, the earth should be thrown up with the knife so as to show the stem where it is to be cut, and they must be sawed off full four inches below the surface. All weeds must be pulled out by hand, and the best way to do this is after a shower of rain.

**LETTUCE.**—Sow Lettuce seed of all kinds the same as former months, only there may be more of it as the consumption will be much greater in the summer months. The various sorts of C<sup>os</sup> have now preference over

the cabbage kinds; transplant any from seed beds, choosing a day after rain, they are better on the seed beds half the month, than planted out in dry weather, for watering is a farce when it is confined to the mere plants. If you really want to get some out, and the weather is dry, soak the whole piece intended to be planted as soon as the hot sun is off, and plant out in the evening, soon after, or before the sun is high up in the morning, but the soaking must be all over, and not in rows or in any other partial way. If you do not want the place where the Lettuces are taken from, leave some to grow to heart where they are, taking care to leave them far enough apart to grow.

**SALADS.**—Sow a succession of all the kinds as in other months, keeping the quantity about right for the supply.

**CARROTS.**—Sow for succession, and to keep the table supplied all the autumn, thin the crops already up, and weed them, remembering that if the table is to be supplied from them constantly, they need not be hoed out so wide apart as if they were all to swell for storing.

**TURNIPS.**—Sow more, and weed and hoe out those already up, if broad cast, to six inches apart, and if in drills about four to six inches in the drill, for the drills are wider apart, and the Turnips might almost touch each other in the row when swelled, without much mischief.

**PARSNIPS** may be thinned to nine inches, or even a foot apart, for they swell almost according to the room they have for swelling.

**ONIONS.**—Weeding and thinning are the only operations required here, they ought not to be left more close than four or six inches if they are to swell well for storing; if you require small Onions for use it is an excuse for leaving them closer, but they must then always be pulled by some one who knows what he is about, and the smallest should be taken out, and the finest left in to swell.

**SPINACH.**—Sow at the usual periods before mentioned, according to the supply required, either then thin out far enough apart to take leaves only as they grow, or keep them thick until the largest is big enough to draw for use, which it will be when it has leaves as large as a penny piece, then it may bear all the largest drawn, the rest well watered, and in two or three growing days they may be pulled again, taking some out where they are very thick, whether large enough or not. I have always sown very thin in the first



instance, and thinned them only by drawing for use.

**TRANSPLANT CABBAGES.**—The spring sown ought to be large enough by this time, but all the oldest sowings should be planted first, draw up the earth to the stems of earlier planted crops; in planting advantage should if possible be taken of rain, for they then receive no check, but the distances may be chosen according to circumstances; if ground be scarce, they may be in rows two feet asunder, and the plants only a foot and a half apart in the row, but they will be all the better for two feet each way. The early Cabbage, which are hearting, may be improved by tying in the leaves pretty close, as you would a cos-lettuce, it makes a smaller but a closer heart than there would be in the same time unaided; sow more seed of the imperial, or other good quickly growing sorts, and sow savoy seed.

**CAULIFLOWER.** — Those protected under glasses ought to do without them by the middle of the month, and when the flower is coming the leaves ought to be bent down upon them, to keep the sun from reaching them, for they would be brought forward too quickly and be discoloured as well as open. They will require watering still in very dry weather. Transplant from the spring seed beds if large enough, and also put out if there be any left the remainder of the last year's plants, the ground must be open, well dunged and dug, and the plants be put out two feet asunder every way. Sow Cauliflower the end of the third week, taking advantage of the ground being in a good state from previous rains, or well soaking the day before yourself.

**BROCCOLI.**—Sow all the kinds you intend to use, but the Cape in particular, the quantity must depend on what you have previously done, it is only making another season. If you have sown none before, sow half the first and half the third week of the month.

Sow the different kinds of Borecole, kale, &c. for winter greens. The variegated kale is not only a handsome looking crop, but remarkably tender when cooked.

**BROAD BEANS** if required may be sown to follow the other seasons, though in most gardens more are sown than are cared about while peas are plentiful. However, those who like a succession may continue periodically, three weeks apart in the sowings. Earth up the stems of those up, and forward and top any that may be coming into bloom, that is, pinch the tops off.

**PEAS.**—Continue those sowings as previously directed, as long as you think you have a chance of their coming to maturity, earth up and weed all that are forward and require

it. Tall sorts (and indeed dwarf sorts are better for it) require to be supported by sticks. I have grown Groom's dwarf, which are no trouble at all, the whole season, and found it always prolific, quick in its growth, and in flavour equal to anything. Knight's marrow-fat tall and dwarf are good flavour, and there is an endless variety which diversify the appearance of a garden. Each nursery and seed warehouse has its favourite kinds, and it is to their interest to recommend the best for the locality in which they are to be grown.

**ENDIVE.**—Sow the green, white, and Batavian; a pinch or two of each for an early crop—any open spot will do.

**HERBS** of all sorts raised from seed may be sown if not already done; slips, also, of all the perennial kinds may be taken from the old plants and struck, tearing down the side shoots is the best way to do so, except mint, the roots of which may be chopped into pieces with the spade, and each bit will make a patch.

**RADDISHES.**—Continue to sow both kinds for succession, and if you want to save seed, plant a few fine roots out for that purpose.

**CELERY.**—Put out a few rows in trenches as before directed, and from time to time continue to do this that they may not be all forward alike, and that the supply may be more adapted to family use. Prick out from the seed-bed the small plants to grow stronger ready for final planting; earth the rows of plants that are advancing, by drawing some of the soil from the sides of the trench down into it and close to the plants: when the trench is full, you draw the earth from a further distance, and form it into a bank according as the rows get forwarder, the object of this earthing is to bleach the stems which are the portions eaten.

**WATERING** all crops in very dry weather, weeding and keeping everything clean, drawing out or cutting away portions of the crop where they are too thick, keeping all the edges of beds straight and the paths clean, loosening the earth between rows of plants with the hoe and earthing up the stems, hunting and destroying slugs, grubs, the fly, and other insects and vermin are so many paramount objects which must never be neglected. It ought hardly to be necessary to repeat anything about them, yet they are too often neglected because they do not conspicuously call for it at the time they could be best done. Cabbages are half eaten, lettuces partly destroyed, gooseberry trees covered, the ground cracking, the crops looking parched, and all other outward visible signs of mischief, almost past remedy, appear in some places before such duties are

attended to, whereas, a timely application of a little judicious labour would, at the right time, not only save ten times the trouble, but also prevent the mischief that at last, with all the labour that can be given, cannot be effective; the eggs of the insects will be deposited in myriads, when timely attention would have stopped the very source of the mischief, and like allowing weeds to go to seed, the neglect of a day's labour provides a necessity for a month's; cleanliness, therefore, and neatness cannot be too strongly inculcated; watchfulness against the attacks of insects which destroy cannot be too rigid. Besides all this, frogs and toads should be encouraged, for they are the destroyers of all the gardener's enemies. Birds should never be destroyed, for they, although mischievous at particular seasons, do more good than harm; let them be frightened at seed time and harvest, let them be driven from fruit but not killed, for without them vegetation would be destroyed by the pests they devour; toads, however, and frogs should be sacred, and if they have made insects scarce, give them sopped bread upon your premises rather than they should wander away.

**TOMATOES** should be turned out from their pots this month, about the middle to situations preserved from cold winds, and naturally warm, such as under a south bank or fence, and if there be no better way of doing, throw up a bank on purpose and plant these at the foot.

**CHILLIES AND CAPSICUMS** may also be so planted, but a few ought to be kept in pots in the greenhouse or under a garden light full to the sun, nevertheless under a good bank laying full to the sun, they will all grow well in a moderately mild season.

**VEGETABLE MARROW**, which in fact is any of the gourd species in a young state, should be turned out on warm borders with their balls entire, or if you have not had the means of raising them in heat, sow them under a hand glass now and cover them until they are up, and of nights cover the glasses warm, but if they have been raised in heat, plant them out and cover them with glass every evening until the end of the month; their growth will be materially promoted, if you could make a hole only three feet square, and two feet deep, fill it with stable dung in a warm state, and put six inches of earth in it, this would take four holes of plants two feet apart, that is to say one within six inches of each corner, and train the plants outwards, a good sort will be very prolific and they can hardly be eaten too young.

**PUMPKINS**, which some cooks profess to use in pye making, but which most people

grow for the sake of the size they attain, may also be put out the second or third week if in a hole of dung the better, but they do best on an old dunghill, where I have known them grow to 180lbs. weight. As to the culinary use of them, they are according to my notions very uncomplimentary food to a hog, even when they have had sugar and other good things wasted on them. I have eaten them when not longer than a cricket-ball as vegetable marrow, but there are fifty better sorts of gourd for that purpose, and the best are poor by the side of asparagus, or even a common tender cabbage. Nothing wants less care than the Pumpkin, but if very large fruit be required, the plant should be pinched off a joint beyond the fruit that is to swell, and all other fruit picked off as well as the branches being stopped at three or four joints long.

**CUCUMBERS.**—Look well to the heat of the beds, which must be kept up with fresh linings of hot dung from time to time, for unless the heat is well continued, air cannot be given as it ought to be without chilling the plants. Whenever the sun is out rise the glasses behind, and prop them up with small wedges of wood according to the height you want them. Continue to stop the ends of rambling branches to keep them within compass. Remove old vine where the plant has done bearing, and allow new shoots to take its place for by carefully thinning away old wood as it were, young bearing shoots are encouraged. Many recommend you to keep setting the young fruit, and some of the most modern practical works mention it as a necessary operation. It has long proved that the fruit which does not set at all comes much more handsome and better for table having no seeds. Let the fruit take its chance, only do not let two grow close together on the same branch if you want fine fruit. If they are only for your own supply, two twelve inch Cucumbers on different days, may be more acceptable than one eighteen inch Cucumber. Of this the grower is the best judge. Refresh with occasional watering, cover warm at night; some will only now begin to put out Cucumbers in hot beds. Many do not value the early production enough to go to the expense or trouble of making dung beds at an earlier season, the same routine of management is however required as in earlier periods, and there will be a marked difference in the quality of the fruit produced even thus late under frames; and the fruit produced on ridges out of doors.

**CUCUMBERS** to be grown under hand-glasses on hot ridges may be planted out this month as early as you please, if not done last month. Dig a trench three feet wide and two feet deep

as long as you please and facing the south. In this trench lay hot stable dung the whole length, pressed together a little, and reaching a foot above the original surface. Let the soil dug out of the trench form a good bank at the back, taking only so much from it as will cover the dung six or eight inches all over, and form a slope to the ground in front, in these ridge out your plants the same way as in a frame and cover them with a hand glass, the holes of plants may be three to four feet apart all along the ridge in the centre of the dung, or you may in a sort of basin sow three seeds for every hole of plants, and cover the glasses down upon them close, giving air by tilting a little as soon as the plants are up, and as soon as there are two good joints pinch off the end of the shoot that the side or lateral branches should be encouraged, these plants will soon fill the glasses. All this month the glasses should be covered of nights, and the mats or cloth should cover the entire ridge because it is as necessary to keep the heat in the dung, as it is to save it in the glasses, by the end of the month you will have to regulate the branches and let them grow from under the glasses by propping them up with bricks, the regulation, if the fruit, permitted to remain on, the stopping of the branches at the length they may be allowed to run, the placing, and if necessary, pegging them in their places to be not in each others way, are matters in which the grower may please himself, and act according to circumstances.

**CUCUMBERS FOR PICKLING.**—Sow about the middle of the month in the open air, in beds three feet wide, and patches three feet apart, the seeds of Cucumbers for pickling, four or five in a patch, with a view of leaving three in the compass of a pot; these may come up when they please, and after you have stopped them at the second joint ramble where they please, the only care required is to lay their branches away from each other so as not to get tangled and crowded in one place, while the bed is bare in another; watering at proper seasons, and gathering the fruit at a right size, is all that is required here.

**MELONS.**—The management of Melons is somewhat like that of cucumbers, except that short of burning, a Melon can hardly have too much heat; so that preparations for fresh linings of hot dung must be made from time to time, the covering of nights must be ample, water must always be placed in the hotbed to get to something like the same temperature before it is given to the plants, and they will require but little of it: the mats should be taken off when the sun is up and air given during the day, but as the sun lowers, the lights must be shut down and the frames covered up to keep

in the heat, yet even this necessary precaution to keep the heat in, does mischief by excluding the light; this shows at once the value of some transparent covering which will preserve the warmth. As the fruit appears, the quantity must be regulated according to your wants, the vines ought not to have too much to do, each plant should only have one melon at a time above half-grown, when another may be allowed to swell, but do not allow two to be at all near each other in growth, indeed, I have allowed a Melon to get nearly to its size before I allowed a second to remain on the same vine, and I have had some as fine as any the very year after Mr. Duncan's treatise was published, a treatise which I found of the greatest service in attempting to grow Melons for prizes.

**MELONS AND CUCUMBERS** under transparent substitutes for glass. Proceed in the same way as if you were going to grow a ridge of Cucumbers under hand glasses: get four deal boards two of them nine feet long, and two four feet six inches long, join them together at the corners with blocks of wood, and at three feet from each end, put a flat piece two and a half inches wide, an inch thick with a groove cut down the middle, dove tailed from one side to the other forming two rails three feet apart and three feet from each end, then on the end boards nail a four inch wide piece of three quarter inch stuff outside of the top so that an inch and a half shall stand up above the board, and two inches and a half wide be below the edge, this being on the top where the two rails are complete ties to the whole concern, forms a cheap three light box. Then make three frames three feet by four feet six of inch-and-half stuff, two inches wide, and two bars across from corner to corner, or from side to side, to prevent their warping, upon these frames stretch glazed calico as tight as you can, fastening it on the surface with tacks rather close together, when this is done, with the unglazed side upwards, lay on the proper waterproof composition, which can be had in bottles quite as cheap as it can be made in small quantities, and you will have a complete three-light box, which for many purposes will be found equal to glass, these three lights will slide up and down the same as ordinary glazed ones, the two rails which strengthen the box, forming supports for the lights to rest on, and the groove down the centre carrying off the water that will run in where the lights meet. Of course the box and the wood-work of the lights will require painting. If you do not like the trouble of making these, any jobbing carpenter will make them for a trifle. On such a ridge as I have described for growing Cucumbers under hand-glasses, but made to slope as much as the lights ought to slope, you

may place this three-light box, and in the centre of each light, place three or four Melon seeds with a view of keeping two or three of the strongest, or if you have them raised any other way, place three plants already up; let them have air, but not much, by tilting the back of the light; while the sun is on them they may be tilted much higher than on dull, cloudy, or wet days. Let them be stopped at the second joint, their lateral branches be regulated so as to fill the box, let one fruit at a time on a plant be swelling, and act in all respects as if they were under glass, as the plants will soon fill the box, if the summer prove hot the boxes may be propped up, so as to let the shoots run out underneath, and in the hottest part of the day, the light may be taken off and the entire influence be admitted. But this is rarely the case in May, and will come more appropriately in the directions, for June and July, or even August. This waterproof substitute for glass makes excellent and very light substitutes for hand-glasses, and when stretched on wood frames, constructed almost as slightly as canvass-meat covers, may be used on these ridges in the same way as is directed for hand-glasses, only that their lightness renders it necessary to peg them down. There are those who have the frames made heavier, but there are disadvantages which more than counterbalance the mere trouble of pegging them down, besides which they are less liable to damage, when they are very light, for if they were struck against one another, heavy ones would burst the tight covering, while light ones would not. I do not say that these things will be found equal to glass, but they will do so well, that hundreds who would never go to the expense of glass, may use them with great satisfaction, and as a general rule those who use glass for their hot beds should use transparent waterproof canvass to cover up from frost, because by such means the plants have the advantage of hours more light than when covered up, as they must be early, with double matting all through winter, for it has been found, that waterproof material which will not exclude the light, will confine more heat than two thicknesses of bast matting, which puts them in darkness the moment they are covered, and continues them so until the day is forward enough to uncover again; in frost when they must not be uncovered at all, they have light instead of darkness.

#### FRUIT GARDEN.

FRUIT TREES continue to rub off while very young, the shoots not likely to be wanted, those which come where there is already plenty of wood, those which shoot outwards from the wall, and those which come where they would

be in the way: where, however, there is plenty of room on, the wall and good shoots come near enough to appropriate, they should be carefully laid in their places, and be held there by loose shreds until they are done growing. Thin Wall Fruit as soon as it is large enough to see which would stand, the first thinning ought to be before any of the strength of the tree is wasted on produce; for after all that can be said of the tarts made of the spongy half grown Apricot, Nectarine, or Peach, they are but apologies for fruit; the first thinning ought to leave all the fruit room to swell, and then probably when they are large enough to be useful they may be reduced still more: in good seasons a tree is generally made to produce three times as many as it ought, and of course the large number is about one third as fine as it ought to be.

FRUIT TREES AS ESPALIERS, require just the same attention as to removing shoots not wanted, thinning the fruit into a reasonable quantity, and that too before they have attained any very large size; the standard trees would be just as much improved in produce by the same means, although the trouble would be great, yet persons who have choice fruit on Standards would find in many cases the trouble repaid: generally the tree regulates its quantity for the wind will shake off the fruit worst nourished, and in some measure counteract the effects of too heavy a crop, but hundreds of trees suffer from bearing too much and the fruit is the worse for being too many.

INSECTS AND GRUBS.—The syringe is the most efficacious of all the means for cleaning trees. With a fine distributor, the proper garden syringe will send their fine streams with force enough to disturb snails, slugs, grubs, the fly, and most other pests, and that without breaking a leaf or breaking off the fruit. When this has been done, the earth under the trees should be cleared of the insects that have fallen.

VINES.—Allow not a single shoot to grow that is not wanted, and as the branches which have fruit on will now show their treasures, pinch off the end of the branch one leaf beyond the last bunch. In some of these fruit-branches, there will be found three bunches of fruit, directly you see which is the best, pick off one or both the others. If there has been a proper quantity of the fruit-branches left on, one bunch is enough for each to bear, and then there should be no more branches grow for bearing wood next season than there were the present, for by keeping the quantity down to the size of the vine, and allowing only one bunch to perfect itself, for each eye, the crops will be always good, and the fruit early and fine.

The borders in which Vines are kept should be gently opened on the surface, but not more than two inches deep, and no plants of any description should be allowed to grow, first, because, vegetation of any kind robs the Vine of nourishment, and secondly, because it keeps the sun from giving all its influence to the roots; there is yet another reason, perhaps more important than either, which is, that the digging and dressing a border for crops prevents the Vine from making its roots near the surface, the heat of which in warm weather does as much towards ripening the fruit and perfecting the wood as the heat on the wall does, they should not therefore be disturbed more than two or three inches, nor should weeds or vegetables of any description be allowed to grow in the border, particularly within six or eight feet of the wall.

**STRAWBERRIES IN BLOOM.**—If the weather, prove dry they must be watered, but it is better to lay clean straw or long stable litter between the rows, and the waterpot labour will be greatly lessened, as the moisture will not evaporate so quickly, and twice a week watering in the driest season will be better than three or four times without that precaution. If the runners are not wanted and begin to grow before the fruit swells, pinch them off, unless they are more wanted than the fruit, which with new sorts is sometimes the case, you may in this case go to the other extreme, and prick off the bloom so as to throw all the strength into the runners.

All the trees that have been grafted require that any growth which has been made by the stocks should be removed, that their whole strength should be thrown into the grafts, the clay or grafting wax may be removed to see if the union is complete, and if so, it may remain uncovered, although there may be a tie or bandage placed on awhile longer. Stocks budded last summer should be equally well looked after, wherever the stocks have pushed out shoots they must be taken off and the bud alone be allowed to grow, and the examination must be repeated several times, as a branch fairly started from the stock would completely take the lead and stop the growth of the bud until it was cut away, this would be a serious loss of growth for the bud, and if not discovered pretty soon would cause a years' growth to be lost. Stocks ready for grafting should be trimmed, so that the strength may not go into laterals and form a bush.

#### FLOWER GARDEN.

**HYACINTHS, Narcissus, and many other bulbous plants** are now forward for blooming, they must be defended from heavy falls, and

also from the hot sun. If they are in beds there is no difficulty, if they are in borders they must sometimes take their chance, but a good deal may be done by very temporary means. I have seen cheap beehives, or rather slight things made like beehives, covered over the patches with great advantage; they are straw coverings instead of glass, and for many things are a valuable protection, they are so quickly covered over things, and so easily removed. When towards the end of the month the bloom decays, pull off all the pods of seed unless you want them, the ripening of seed weakens the root much. It is not wise to take up the roots until the leaves are decaying fast, for while they are green, the root is gaining size, strength, or solidity, or all three; other bulbs may be treated in a similar way, but if you mark places where bulbs are, you may do as you like about taking them up. There is something in favour of it, which is, they are at once safe from ground vermin.

**ANEMONE.**—Many varieties and species of this class are cultivated, but in mixed seed there will be found all colours, and the double ones may be bought by name.

**ASTER.**—Under this head come all the numerous varieties of Michaelmas Daisy; these should be selected in plants, for one of each of a dozen sorts would be all that can be wanted.

**CARNATIONS and PICCOTEES** are all potted in their blooming places, or at least ought to be, nevertheless, in large collections there are always many over and above the number actually bloomed in large pots. These may be potted one in a pot, size twenty-four, and if, as well attended to, will equal those in full sized pots. The object of which is not so much to find room for the roots as room for layering. A single plant in a twenty-four pot, well attended to, will often reward us with a fine bloom, but the bulk of the overplus stock should be planted in the ground in beds: such beds should be constantly stirred over the surface, and bean stalks and other earwig traps should be laid and often examined, for a stray earwig will do an infinite deal of mischief in an incredibly short time.

**TENDER ANNUALS** of many kinds may be changed from one sized-pot to another. Cockscombs, Balsams, Egg-plants, and such others as are to be grown to their full size in pots must be constantly changed to those a size larger, whenever their roots fill the one they are in; they should be also kept close to the glass in whatever place they are grown, but frames and lights, or pits and lights, are decidedly the best for such plants; the heat, whether dung or tan, or hot-water should be kept regular. If dung-heat be used they ought to go into a new one, as they will require plenty of

warmth. If your plants have not been potted at all yet, place them one each in a large sixty sized pot, or if they have been already pricked out into a bed, or in pans so as to strengthen, they may at once be potted into forty-eight sized pots, all others not yet potted off may be either put one in a small sixty, or two or three in a forty-eight, depending entirely on the use to be made of them, if they are to plant out in clumps as soon as it will be safe it may be questioned whether you will do any thing till they are planted out in the second week, but if they will be wanted for succession, they may be potted in smaller or pricked out in large pots. Many earth between the pots in frames, and especially with balsams, combs, and the like, but it is awkward, for they cannot be shifted about so well. All plants in frames must have air given by tilting up the light at the back. About the second week the annuals that have been raised upon heat may be planted out in patches in the borders or in clumps or, wherever they are to bloom.

**HARDY ANNUALS**, as they are very many of them improperly called, may be also planted out where they are to bloom, at the end of the second week. Ten-week Stocks, China Asters, French Marigold, China Hollyhocks, Nemophylla Colinsia, and many others, but there are some of these that are better sown and grown in pots, and turned out with the ball entire than separated and planted out. Yet I have planted out the smallest annuals successfully, or rather patched them out, for taking a pinch or tuft of the smallest from the hot-bed on which it was raised, I have transferred it to the borders where they have flowered as well as if they had been originally sown there or at least so nearly, that persons who did not know the fact would not have seen the difference.

**HARDY, HALF HARDY, AND TENDER ANNUALS** may be sown in beds and borders, and clumps, they will succeed those already out, as well as those raised in heat; Sweet-peas, Lupins of all the annual kinds, Larkspurs, Convolvulus, major and minor, all the californian and other recently introduced annuals, &c., these may be sown in patches any where that room can be found not wanted for other occupation.

**DAHLIAS**.—Harden off in cold pits, merely covered up from nightly frosts, all the seedling Dahlias, and Dahlias raised from cuttings, plant them out the third week, digging in a quantity of dung well rotted, placing a good stake in the ground to tie them up to; they should be six feet apart every way in the grand quarters, but in the clumps and borders, behind and among shrubs, and other

places where they are really wanted to fill up space, and afford a few flowers for ornament, they may be put wherever there can be found good room for the roots; seedlings may be put out eighteen inches, or two feet apart, in rows not more than three or four feet asunder, because as soon as you see a single flower, or an ill shaped petal, you should draw out the plant, so that there is sure to be plenty of room for the few worth keeping; the old roots may be parted, and put out anywhere, either for roots to propagate from next year, or for the sake of their flowers the present season, but all fine sorts may be still propagated, because if there be any demand at all, the pot roots formed later, are the best that can be sold in dry-roots, or exported. All the pot-roots not wanted for plantation, should have a shift to forty-eight sized pots, they may be useful for blooming in them, and make better bulbs or tubers for stock. Plants had in from dealers if weak, may be kept in the frames in a size larger pot, and a little heat, with great advantage. Watch and trap stray earwigs with as much severity as if every one were a hundred, from the first instant they are planted out.

**AURICULAS** may be placed on a dry bottom, and have all the weather as soon as the bloom has declined, and if you do not want the seed, pick off each dead flower by the footstalk, and not by taking the main flower stem. If the seed is required, let the pods of the one or two principal pipes only remain to perfect, better have one pod of good seed alone, than mix it with the weaker and later pods, for by taking some off, the remaining one or two are strengthened.

**POLYANTHUSES**.—If they have done flowering in pots, should be put out, ball and all, in good rich loamy soil; watch carefully that they be not attacked by slugs or grubs, let the strong heat of the sun be kept off by mats, or if there be a border from which the three or four hours of mid-day sun be absent, without artificial shading, it will be still better, because there will be less trouble.

**HEARTSEASE**.—Be not over covetous of seed, let not a pod perfect itself except those of flowers very good of their kind and not more than one or two on a plant, nip off all other blooms as fast as they fade, the forthcoming blooms will be very much better for it, and the plant continues much longer in good order; make new beds with fresh struck cuttings, take off side shoots of all that are worth propagating, so as to keep up a succession of cuttings to make new beds, or additions to old ones, as the new cuttings strike. The beds cannot be of better soil than rich loam well dressed with cow-dung. When I have tried the effects of the various nostrums

now in fashion, I will say whether it is of any use to doctor them. The most I have ever done has been to top dress the beds with leaf-mould, or decomposed dung, and let the watering wash it down to the roots, and I never found this fail to bring as good a bloom as I required. It is more in the choice of varieties than in the application of nostrums, that showers will provide for a winning stand. There are hundreds of varieties so indefinite in their colours and characters, so inclined to flush and run, so crumple and rough, that it is a positive difficulty to find, even in a large collection, anything like twenty-four good flowers fit to exhibit. If you constantly take such side shoots as can be spared from your best plants, and insert them directly in the shade, under a common hand-glass, you will always be able to keep up a succession of plants without any very general cutting up of old plants, but when the beauty of a bed is gone, such kinds as are wanted may be pulled to pieces, and the most likely portions planted with a bit of root to them, and such pieces as have no root may be struck under a hand glass, this, however, will not happen till quite the end of the month, and, perhaps, not until June if you do but prevent them from seeding.

**DOUBLE WALL FLOWERS** will, after blooming, throw out many little shoots, these should be taken by stripping them off when they are an inch and a half long, when they will strike like weeds, if they get too big they are much longer about it, and more liable to casualties, on that account, besides not making such good plants when they do strike.

**AQUILLIGIA**, or the Columbine, one of the most elegant of all the perennials; and if you can get good seed you may have flowers of the greatest beauty, very double, dark and light blue, and rose colour, both selfs, and mixed with white. The Feathered Columbine is also very pretty.

**SWEET WILLIAMS** will propagate as well as pinks, and much in the same way, so that when anything very remarkable shall be found, it may be perpetuated by taking off the gross as it would be called in pinks, and striking them, there may be a time when this flower will take its place among the second or third class of florists' flowers, but not until the serrated edge is got rid of, and the flowers are larger and better defined, there is plenty of room, and plenty of encouragement for the florist to try his hand.

**BIENNIAL AND PERENNIAL** seed may be now sown, such as Wall Flowers, Two Year Stock, Canterbury Bell, Sweet William, Polyanthus, Phlox, Columbine, Primrose, and

other fast growing subjects, were they sown earlier than the middle of May, they would be too forward. All seeds now sown must be occasionally watered, and not allowed to get dry again after they are once sown.

**RANUNCULUSES** and **ANEMONES** planted in February for show in June, must have the surface of their beds stirred, the lumps, if any, broken, and the soil closed well about their roots, which if exposed must be covered up. Copious watering and constant weeding are requisite, those sown in autumn have almost done blooming before the spring sown ones are fairly up, yet if any of the autumn sown ones have not been protected they will be now flowering, and if the length of bloom be any object they should be shaded.

**GRAVEL WALKS** should be picked up, turned, rolled, and if deficient, a little fresh gravel should be put on the surface.

**MOWING OF LAWNS**, weeding of every portion of a garden, watering all sorts of things that require it, are self-evident duties.

**ROSES**.—Cut back some of those that have made growth to the last eye or two—this will have the effect of protracting their blooming so as to form a complete second season; see that all the stakes belonging to standard Roses are in order, and the trees made fast. There is not, by-the-bye, a more ugly, unsightly thing, than one half the standard Roses. People cut back before a proper head is formed, so that the shape of a great majority is as like a common house mop stuck in the ground as anything. The branches should be so allowed to grow as to form goodly limbs in length proportionable to the height of the stem, and when a sufficient number of these are secured of a proper length to form a shapely head, cut in close to them as you like every year, but although people very frequently direct last years' wood to be cut back within a couple of eyes, it is not meant that the very first branches shall be spoiled, and the head of a Rose tree become a bundle of short stumps, such an idea is ridiculous, but I shall devote a paper some day to this subject, either here or in the Gazette, or both.

**GREENHOUSE PLANTS**.—Specimens of a choice kind should be brought out into the open air to get mild rains, and be removed in again at night, all the early part of the month, and towards the middle, any that have done flowering may be plunged in an open spot in coarse clinkers, gravel-stones, lime-stones, or other medium inimical to worms and be constantly watched and watered as if they were in the house. They will not be distressed by the sun on the sides of the pots,

nor will their compost be dried up by the wind. Those in the greenhouse must have all the air they can receive, and during the heat of mid-day, they must be shaded a little by a mat or canvass, or bows of trees, or some other means. Nothing but constant watchfulness and timely, but not over watering, will keep plants in pits, frames, and houses in good condition and colour. Camellias had better make their growth in the greenhouse, unless you have a canvass house in which to place them, when shaded from the violent heat of the sun, and protected from the cold winds they cannot but succeed well.

HEATHS can hardly have too much air, but unless they are plunged they must not have all the sun. If they are plunged the sun will hurt none but those in bloom. As a general rule, if the young wood of any plant starts under protection it will not bear the heat and cold of the open air, but towards the end of the month those which have bloomed and not begun to grow will do admirably in the open air plunged and well attended to. The young wood will come healthy, of good colour and strong, and unless it be very inclement, set well for bloom. The canvass-house is nevertheless the best of all, because if the weather be fine the plants can have all the air, sun, and mild showers, and if it be inclement it can be all closed on the windy side, and the roof be partially or wholly closed.

VERMIN.—The green fly, grubs, and the thousand vermin that plants are heir to, will occasionally infest houses, pits, and even plants out of doors; for those confined there is nothing like fumigation with tobacco, and syringing with clear water; for those on trees and plants out of doors, nothing is so good as the syringe, which even with clear water oft repeated will clear anything if begun and persevered with in good time. Weak lime-water, and tobacco-water are efficacious, but out of doors the latter is extravagant, because so much is wasted, but lime-water is cheap enough, and it ought to be just strong enough to taste nasty; but the best way is to put a quart of unslacked lime in ten gallons of water and stir it well up. After using this, clear water must be used to wash it all off, or the lime-water will dry white on the plants and look ugly. I however have cleared a wall of rose trees with clean water only, by following up the task morning and evening, and seen myriads of the little pests on the ground under the wall, until a water-pot full of strong lime-water finished them. At night the same operation produced the same result in a less degree, and by the third day there was not a fly to be seen. Nobody knows till they have tried the syringing with a distribu-

tor which has holes not bigger than a thread, what havoc it makes among insects of all kind without hurting the young wood. With regard to slugs and grubs, I know of nothing better than strewing lime about the bottoms of walls or hedges, in or near which they are supposed to harbour; or, if they abound, laying down halves of turnips scooped out with a notch in the edge, hollow side downwards, and examining them frequently. If the wire worm annoy you, plunge carrots into the ground, to be pulled up frequently, and the creatures which will be found half worked into them, destroyed: or plant the garden daisy round the edges of beds, when the worm will attack them in preference to anything, and may be taken sometimes half a dozen at a root, but it too frequently happens that people begin these remedies, and relax after awhile, instead of persevering till there is not one left. I have taken hundreds of grubs and slugs by roasting, or half roasting cabbage leaves over a little fire made in the garden, and laying them in the places infected, when, in a few hours the vermin will get on and under them in quantities, but any or all these remedies require following up long after they have diminished the evil until they are all destroyed.

ROSE STOCKS should be trimmed, that is all the shoots that are useless should be cut off, and those which are likely to be strong enough to bud upon, should be alone allowed to grow; in selecting these regard must be had to their situation, it is not desirable to loose height in a stock, so that the shoots nearest the top, if strong enough, or likely to be strong enough to bud on, should be the shoots selected to grow, while those lower down should be cut off, or pulled off before they exhaust any of the strength of the stock, these will be forward enough to bud on by the end of the month, or beginning of June; Roses which were grafted must have all shoots of the stock rubbed off as soon as they appear. Cuttings of China, and other smooth-barked Roses will strike in the shade with a glass over them. Now is the time to pay the first visit to the Rose nurserymen, not only to see the few that bloom naturally in May, but to see which kinds are the best to force, as all of them grow a few sorts in the pots, and the visit should be repeated monthly by all enthusiastic growers, to see the extraordinary diversity of this beautiful flower in each month of the year.

PINKS.—As these flowers throw up their flower stems, each plant must be reduced to one stem, and as they swell their flower buds, they must be reduced to two on each stem, and the two selected must be the two likely to



be nearest, to the proper season for showing; if they are too forward the forwardest buds ought to be taken off, if they are too backward all the laterals only should be taken. As the stems are rising they must have plenty of water to moisten them, and wash in the top-dressing, and if they have not been top-dressed liquid manure will be better than water, the manure liquid being made of decomposed horse or cow dung, at the rate of a pound of it to a two gallon pot of water, and the plants to be well soaked with it once or twice a week in dry weather, but a good inch thick of the decomposed cow or horse droppings all over the bed last month, or the month before, is better than depending on liquid manure.

**CUTTINGS IN POTS.**—The cuttings of China Roses, Heliotropes, Fuchsias, Verbenas, and other subjects that have been kept through the winter in the green-house, or frames, must now be potted off into single pots, or planted out in beds, clumps, borders, and Dutch, or geometrical gardens; of which several examples have been given in *The Gardener and Practical Florist*, only in these gardens, as the principal interest and curiosity is the figure, there must be no tall plants to hide the walks, and spoil the outline; the most elegant are those under six inches high, such as Verbena Melindres, which trails close to the ground, and covers the space allotted to it with dazzling scarlet blooms, there are now other dwarf varieties of the same character, if you can get those of different colours they will be beautiful; then there are the Fairy Roses not more than six inches high, and of several shades, form splendid beds, Pansies, all brilliant and variegated form excellent clumps, and never get up too high, and several annuals described in *The Gardener* are well adapted: these are supplied by seeds, or plants already raised, but the Verbenas Roses, &c. must be planted out from the winter stores; the Mimulus forms a brilliant object. Hydrangeas, Geraniums, Calceolarias, Petunias, and such like subjects do for clumps on a larger scale, so also do the taller Verbenas, many of which are quite shrubby, they also make fine objects well grown in pots; the cuttings of Hydrangea form excellent plants with only one head of the side shoots are taken off, when a good bold mass of bloom is indicated, but all kinds of plants not quite hardy may be put all over the ground in the middle of the month.

**TULIPS.**—As soon as the buds begin to show the colours they must have very little sun, therefore get your top cloth on the stage; let the sides and tops be as open as possible all mild warm weather, except that the top cloth

must be rolled up, and unrolled so as to keep off the sun, and no more, but until the colours have exhibited themselves, the sun except in the great heat of the day, will not be hurtful. Enthusiasts will not uncommonly watch or have a watchman all night, that if it happen to be warm, the bed shall be entirely exposed, and if a cold wind come on, or the air only set in cold towards morning, all the cloths may be let down to cover them in; and during the bloom nothing conduces so much to the well being of the flowers as merely lower only so much of the covering cloth as will just keep the sun from the beds. If the weather prove very hot, the paths of the tulip-bed may be watered with great advantage, the evaporation keeps the place cool, so also will it be useful to sprinkle the side cloths from the inside that the wet may not sprinkle the flowers. Every hour they can be allowed to have all the air strengthens the plant, assists the colour, increases the size of the flower. I am an advocate for side blinds, which will prop up and down like shutters, hanging by hinges at the upper parts, by this means the entire air can be given if necessary, or it may be modified by putting them half up, or shut out by having them fastened quite down. The canvass in these blinds may be as light as if it were a fixture. The common beds of breeders, and outbeds of Tulips may be merely covered with hoops, and light waterproof canvass, or if that cannot be had, with canvass not waterproof, but by having it waterproofed you can have the stuff so much lighter and do the flowers so much less harm. In the absence of both, then mats will do as they have done for years before, but there is no comparison in the efficacy of lighter materials. Towards the end of the month the flowers will begin to fall, and as soon as you have seen as much of your bloom as you wish, they may have all the weather; but the top surface must be cleared, every weed must come off as it appears, in all the beds, and the surface always be kept even and tidy. If you do not want seed, pick all the pods off as soon as the flower drops. There is much good done by the occasional stirring of the surface, it closes the earth round about the stems, which else will, by the wind blown, form vacancies all round them, by which vermin are harboured, which would otherwise be disturbed and got rid of. Some of the outer beds with common flowers and breeders may be sufficiently matured by the end of the month to come up, and advantage should be taken of all opportunities of getting on with work of this kind, for if those which might be got up early are left until all the rest are ready, the job is so extensive as to frequently make one postpone it; whereas by seizing the opportunity of

doing each bed the instant it is ready, we get the ground clear and open for any thing else that may be fit and proper to fill up the place with. The best bed is not likely to be ready before the second week in June, and in many places even the out of door beds will not. When Tulips are taken up they should be put in their respective boxes, with the earth hanging about them, and the stem should be cut off on all occasions, all but half an inch, or an inch of the bottom, for if you attempt to break them off there will often be a piece of the bulb break off with them, and the root will be greatly injured by this if it do not entirely kill it. The Tulips in the open ground are often very fine and useful for showing, when this is the case, it is better to cover them or shade them in some temporary way, than to leave them to the mere cloth or mat, because, a drop of rain in the cup hurts one.

**HERBACEOUS PLANTS, PERENNIALS, &c.,** of many kinds, propagate themselves by spreading, and would, if not parted or prevented by other means, overrun a border; others which do not spread so rapidly, nevertheless increase fast, and in almost all cases weaken as they spread. The exact time to manage them with advantage depends entirely upon circumstances, which may differ, not only as regards the plants themselves, but as respects the wants of the owners. Polyantheses, Primroses, Auriculas, and others which are propagated by parting, should be taken up and parted every year, because they bloom finer for it. These should be parted the present month, as soon as their bloom is over; the Polyanthus and Primrose will require the use of the knife. They should be immediately placed in beds, six inches apart, and be watered; they will have all the summer to grow in, and be ready for planting out in the borders in autumn. Scarlet lichness-phloxes, and others of that close growing kind, may be chopped round with a spade into reasonable dimensions, and all the pieces chopped off should be dug fairly out, parted, and planted in nursery beds, and fresh soil placed in the holes left, so that without disturbing the originals, they are left of a moderate size, and will be greatly strengthened by the new soil, into which the roots will make their way. The following are among the perennials which I should recommend to be procured, if the place be large enough to grow them, for there is nothing more necessary than to be choice of the subjects cultivated in gardens, yet nothing so little attended to in large establishments, where may generally be seen on herbaceous borders, and the borders round shrubberies and dressed ground, the most common and uninteresting weeds, or plants, not much better. The following subjects are worth attention, and may be raised from seeds,

at least such of them as may be wanted in any quantity and variety.

**CAMPANULA.**—Here there are some very interesting varieties; the *C. Pyramidalis*, or chimney Campanula, is very handsome, both white and blue, so also are the double blue and double white Canterbury Bell, but a few plants will be all that can be wanted.

**DELPHINIUM, or Larkspur.**—The perennial kinds of Delphinium are exceedingly showy, and there are several very distinct sorts, such as *D. Grandiflorum*, *D. Azurea*, the single and double of the Chinese kinds, but these would not be worth raising from seed, as there is no chance of adding much to the varieties, nor is there much difference in the qualities; they are for the most part brilliant in colour, and elegant in growth.

**LUPINUS POLYPHYLLUS.**—Of these, the most elegant of all the Lupin tribe, there are many shades of colour, and it is worth growing them from seed. There are also several varieties of Perennial Lupin, such as *Arboreus*, and its varieties. It will not be worth while to grow them from seed perhaps, for the best of them are coarse compared with Polyphyllus, and it is better to see them in plants; and if you take a fancy to any one, buy a specimen or two.

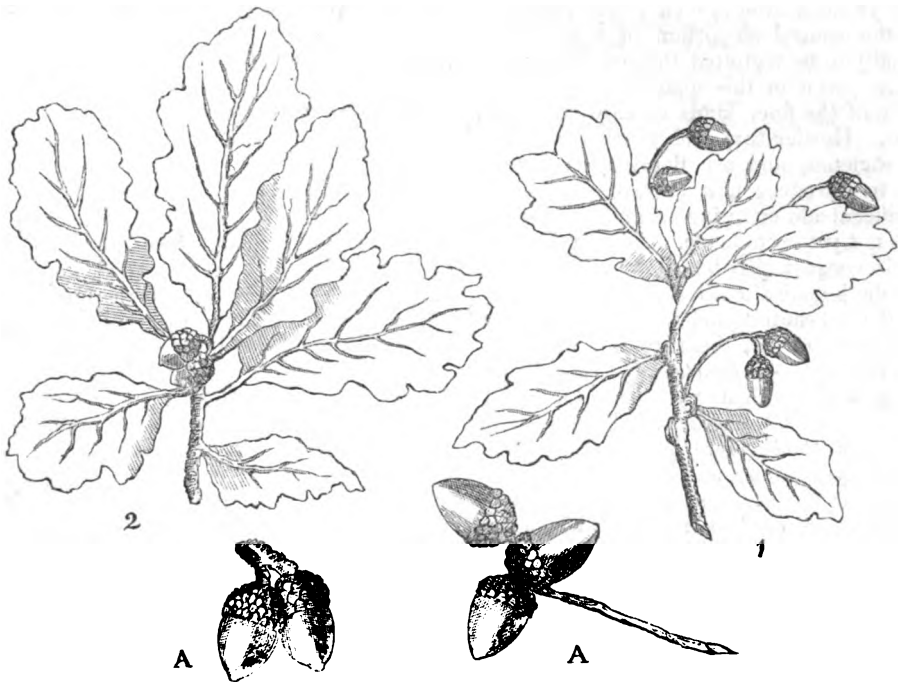
**PENTSTEMON.**—This plant is running into all kinds of varieties, besides there being several very distinct sorts called species. Of the most striking, there are—*P. atrorubens* (red), *P. campanulatum* (purple), *P. digitalis* (white), *P. gentianoides* (crimson), *P. coccinea* (scarlet), and *P. speccosum* (blue); they are all constant bloomers, and keep gay until the frost spoils the flowers.

**PHLOX.**—Of these there are many varieties, differing in height, colour, size, season of blooming, and habit. There are scores under name, but they can only be selected properly when in bloom, and the season of bloom should be noticed according to the wants of the grower.

**SALVIA, coccinea** (scarlet), *bicolor* (blue and white), and *patens* (bright blue), should be in every garden, however small, if no more but one plant of each. It has been thought that *Salvia patens* ought hardly to be placed among hardy perennials, but I have seen no instance of its being killed by the winter, and certainly the only precaution against it would be to cover it with a little litter.

**ANTERRHYNUM, or Snap Dragon.**—This has of late sprung forth in so many varieties, that if raised from mixed seed will give twenty sorts.

**DIGITALIS.**—There are three or four varieties of this worth growing among the shrubby borders, merely because they throw up a gay spike of flowers which may be seen a good distance.



GRIGOR'S EASTERN ARBORETUM,  
OR, TREES OF NORFOLK.

PROBABLY there is hardly a county in England in which there could be found better specimens of everything appertaining to agriculture and arboriculture than Norfolk. Mr. Grigor's Eastern Arboretum is, in part, a practical lecture on the growth, the habit, the management, and the natural history of the trees of Norfolk, and comprises in its list nearly all those which have any reference to the timber of the county. The principal features which belong to, or connect it with its circumscribed title, is the fact of selecting for the illustrations, portraits of specimens growing in Norfolk, and certainly the specimens, are not only very remarkable, but the character of the foliage, and the habit of growth, are so well depicted in the engravings, that the book is a valuable acquisition to any library of illustrated natural history. The work is avowedly a compliment to the county of Norfolk, of which it might be called the Arboricultural History. There are introduced some very interesting sketches of the seats, and parks, whence the specimens were taken, nor is the author at a loss for poetical embellishments, where they can be applied with effect. The preface is a general panegyric on trees, and in an introduction which follows, the author gives us his motives for the publication, and an outline of the plan he has adopted. From this we are carried on through an essay on

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trees in general to an account of remarkable trees in the city of Norwich, and a proposal for a public garden, from which proposal we extract a few passages, not less on account of the general interest the subject possesses, than because it is a fair specimen of the work.

"First, then, a public pleasure-garden would form a delightful promenade. Here the inhabitants might repair to meditate and amuse themselves. At present Norwich possesses nothing of this description; for Chapel-field, from its being so much the resort of loose and idle boys, and being occupied partly by washerwomen, seems to be in a great measure deserted by the respectable citizens, so that the want of such a place for recreation and amusement must be felt by many. To take excursions about the streets or highways is found to be tedious and disagreeable, and, to children, dangerous. In a garden, however, such as we are recommending, all would be perfect security—here the juvenile branches of a family might play at pleasure; and whilst it would supply the youthful mind with interesting associations, it would be at the same time healthful and exhilarating.

"But, apart from its being a scene of beauty and attraction in itself, it would stimulate all our amateurs in the city to procure those ornamental trees and flowers hitherto unknown, or not generally cultivated in this quarter, so that

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all our gardens around would take their tone from this central emporium of taste. It is especially to be regretted that so little attention is given in this quarter to the introduction of the finer kinds of hardy trees and shrubs. Horticulture and Floriculture have their societies, and are flourishing; but any effort to introduce new or rare trees—those magnificent and enduring ornaments of nature—has not yet been made. Around Norwich there is consequently but few novelties to interest the botanical cultivator.

“Of the beautiful and numerous species of the genus *Cratægus*, there are only three generally met with—*C. punctata*, *C. Crus-gilli*, and *C. Oxyacantha* with its varieties. Of the like numerous and not less beautiful genus of the *Æsculus* or *Pavia*, there is only the common *Æ. Hippocastanum*; and indeed so general is this want of novelty, that one cannot but wonder how so few of those fine trees which have been so long in cultivation have found their way into our gardens. A botanical collection, open to the citizens, would remedy this; for to see trees is far more persuasive and satisfactory than a picture or description of them, however elaborate. No one scarcely can walk through the gardens of Chiswick, Hackney, Chatsworth, or any old arboretum, without resolving to add to his collection such trees as he does not already possess; and it is unquestionable that if such a stimulus were commenced here, it would soon have the effect of enriching and beautifying our country.

“A garden such as we have recommended would be the means of enabling us to distinguish botanically what trees are really worthy of cultivation for the sake of their timber. The immense national importance of such a facility will appear as we proceed. Almost every one knows that the English oak and the Scotch pine are of great use in the arts—the one being chiefly used in ship-building, and the other in house-carpentry; but it is not so generally known that of each of those trees there is a spurious species, quite worthless for all the purposes of economy, universally propagated in our country along with the valuable kinds. A writer in the *Quarterly Review* makes the following remarks on this subject:—‘We have here to notice a fact long known to botanists, but of which our planters and purveyors of timber appear to have had no suspicion—that there are two distinct species of the oak in England, the *Quercus Robur*, and the *Quercus sessiliflora*; the former of which affords a close-grained, firm, solid timber, rarely subject to rot; the other more loose and sappy, very liable to rot, and not half so durable. This second species is supposed to have been introduced some two or three years ago from the conti-

nent, where the oaks are chiefly of this latter species, especially in the German forests, the timber of which is known to be very worthless. But, what is of more importance to us is, that, *de facto*, the impostor abounds, and is propagated vigorously, in the New Forest and other parts of Hampshire; in Norfolk,\* and in the Northern Counties, and about London; and there is but too much reason to believe that the numerous complaints heard about our ships being infested with what was called, improperly enough, *dry rot*, were owing to the introduction of this species of oak to the naval dockyards, where, we understand, the distinction was not even suspected. It may thus be discriminated from the true old English oak:—The acorn-stalks of the *Robur* are long and the leaves short, whereas the *sessiliflora* has the stalks short and the leaves long; the acorns of the former grow singly, or seldom two on the same foot-stalk; those of the latter in clusters of two or three, close to the stem of the branch.’

“The annexed figures will enable every proprietor to ascertain whether or not he is possessed of the right sort; Fig. 1 representing the leaves, and 1 A. the fruit of the true British oak; and fig. 2 and 2 A. that of the less valuable variety.

“To have trees and flowers collected together, and planted for the purposes of being seen and studied, is to many people as interesting as a collection of beasts, or birds, or insects; so that apart from its advantages to the mere arboriculturist and florist, a Botanical Garden would facilitate the important researches of the scientific naturalist, and store the minds of youth with pleasing and interesting associations; it would engender better propensities amongst the community in general, and lead them to leave off their unprofitable and useless habits. It is to be hoped that the time is not very distant when every town and village shall have its library, scientific institution, museum, and public pleasure-garden, as was proposed in a bill submitted to the House of Commons by Mr. Buckingham; for we believe that if ever mankind are to be better than they are, it will be through the establishment of the different branches of Natural History throughout the country.

“Enough has been written to show what is meant, and the subject is now left in the hands of the influential gentlemen of Norwich, without whose aid a Botanical Garden cannot be carried forward. We trust that our humble efforts to set in order some of the vegetable kingdom, and to provide a source of rational amusement on our holidays, will

\* We are happy to be able to say that such of the oaks as we have examined in this quarter have been of the *Q. Robur*.

not be made in vain. But even should our appeal be disregarded by all, we have the consolation to know that every one must dismiss it from his mind with the admission, that the study of trees and flowers is a highly moral and mental employment, and withal very favourable to health.

"In our opinion, the best site for the proposed institution is Chapel-field. It is already full of the element of every thing that gives dignity and grace to garden landscape—a copious supply of water, some noble specimens of old trees, with several hundred yards of rockwork-wall admirably adapted for Alpine plants. The soil is good, the situation convenient, and the fence, on one side at least, complete. We do not suppose that a single individual would feel aggrieved by its being converted to such a delightful purpose, whilst we are sure that many would welcome the change. We wish it to be thought of.

"As we are aware that some men throw a world of difficulty around the establishment of 'new things,' such as we are advocating, we should be most happy, by way of obviating some of them, to pledge ourselves to present to any committee of gentlemen who might be appointed to carry the work into execution, a plan or design of the ground by the most eminent landscape-gardener of the present day, as well as to see it properly carried out."

By permission of the author we have given a sketch of the leaves and fruit of the two kinds of oak mentioned, the account of which we consider very interesting. One feels a sort of national concern in a question so important as that of the character of the oak, which we are cultivating, and would fain hope, that the author has over-rated the mischief. The author then proceeds to describe the manors, gentlemen's seats, parks, and domains, from which he has drawn his subjects, and we trust there is not, or if there be, will not long remain, any person of condition in the whole county without this especially acceptable volume. We must also mention that the work contains 50 most excellent illustrations of trees, which admirably depicture the principal specimens of the county.

#### THE BEST SIX GREENHOUSE PLANTS.

THE numerous societies which give prizes to the best greenhouse plants and the great ease with which a very small greenhouse could be made to grow them, render a few observations worth the notice of all young growers, for instead of such prizes being year after year run away with by the same parties, there might as well be fifty or five hundred competitors as one. I venture, therefore, as a

successful cultivator, to give a few, I trust, useful hints as to the kinds which it is best to grow, and the easiest manner of producing them in fine order; I shall first mention a few plants all of which will greatly assist in producing a good effect and from which there will be no difficulty in choosing the most striking to form the group on the day of show. I shall first, however, remind the grower that the six plants should be six different genera; and, therefore, where I give more than the plant in a genus, only one must be taken, and that will be the specimen which happens to be in the best order at the time.

We shall only mention those plants which bear a very large proportion of flower to a small quantity of foliage, and which give an opportunity for the exhibition of skill. Fuchsias, geraniums, azalias, rhododendrons, calceolarias, heaths, cinerarias, and many other genera which have been recognized as florists' plants, and broken into many varieties, are generally excluded from exhibitions of greenhouse collections. We can hardly fancy a more beautiful half-dozen than might be selected from the following, which give a choice of colours.

Hovea Pannosa .....	} purple and white.
or Celsii .....	
or Illicifolia .....	
Eriostemon buxifolus .....	white.
or Cuspidatus. ....	ditto.
Epacris Grandiflorus .....	crimson with white tip.
or Impressa .....	pink.
or Campanulatum album .....	white.
Lechenaultia biloba .....	bright blue.
or formosa .....	scarlet.
Borronea serulata .....	dark pink.
or crenulata .....	light pink.
Chroosema cordata .....	orange and yellow.
or varium .....	ditto.
or Henchmanea .....	pale claret.
Styphelia tubeflora .....	crimson red.
Coleonema Gracilis .....	pale rose.
or Tenella .....	ditto.
Cosmelia rubra .....	red.

The plants here mentioned may be grown bushy with care, and should be begun from small cuttings. Their foliage is very different from each other; they would look pretty objects without bloom, and if their health be preserved up to the flowering, they will be splendid objects. The plants should be got small, and they may instantly be topped. If you can get handsome plants rather forwarder, well and good, but I would sooner have them just struck than anyhow. The soil that suits one will suit all. I have grown them almost as wide as they were high, and yet the Hovea, and Epacris, and Cosmelia want to

make shoots so opposite to bushy, that they require the most constant watching and attention. However, if I had to advise a novice, I would say, go to the nurseries and pick out the *Hoveas*, *Epacris*, *Cosmelia*, as short as you can get them, and as young, the others may be found handsome and bushy from six to twelve inches high. Let the *borroneas* be of dark green foliage without a touch of brown or yellow, for they are miffy things. When you get these plants home, turn out the balls from the pots to see if they are full of roots, and if they are, prepare a pot, but a little larger, half an inch all round. The soil to grow these things in may be rich loam from the top spit of a meadow, or, which is the best of every thing, rotted turfs which have been cut thicker than usual. This has of course a good deal of vegetable manure in it, and is always rich in itself. Take of this loam then, two measures, and of peat mould with the half decomposed fibres in it, one measure, well mixed and run through a coarse sieve, for although finely sifted mould or compost is not good coarsely sifted compost is; therefore the sieve should be coarse enough to let horse beans through it. To this when you use it add decomposed cow dung in all the early shifts, one-fourth in quantity, that is to say, three measures of the mixture, and one measure of the dung, this also should be run through the same sieve for it takes out lumps and large stones. This all being well mixed together, will grow any thing from a heath to a *camellia japonica*, but for heaths, I should add as much more peat mould as decomposed dung. Now to our present job, which is repotting our young plants supposed to be just obtained from a nursery, let the ball remain entire, and if the drainage comes out of the pot with the ball, do not remove it; now, put in the bottom of your new pot one-third in height of well broken crocks (pieces of broken pots), if this keep your plant too high in the pot, make them lowest in the middle and higher on the side so as to let the collar of the plant be as high as the top edge of the pot; before you put the ball in take off the mould from the edge of the upper surface, but only just what will remove with your fingers without bruising or rubbing the fibres, set the ball in the middle of the pot and carefully fill up all round it with the prepared compost, adjust the collar of the plant so as to be when you finish it exactly level with the upper edge of the pot, and fill up the new compost below the edge, so that the rounded surface of the ball forms a sort of hillock in the centre, make the new compost down the side solid, by knocking the pot a little on the potting table, and if necessary by poking it down a little as you go on, with a thin stick, but avoid

this if you can, it is very apt to damage the fibres which are on the side surface of the ball, and every one that is injured weakens the plant though it does not always show it. When they are thus repotted, examine them well and pinch off the end bud of any branch that is more vigorous than the rest, or if you are beginning with a small plant pinch off the top; in short, pinch or very neatly cut out the buds, wherever it is growing out of shape, from the time you begin with a cutting, to the period at which you mean to bloom it. The fibres will soon feel the benefit of the shift they have had, and the growth of the plants will be rapid—let them be near the glass.

The plants will soon grow fast; they must be carefully watered, but not while the soil is wet. The whole of them should be examined daily, and in very hot weather twice a-day. If the soil is once allowed to dry so as to shrivel the points of the fibres, the plant will be greatly injured, and may not get over it. If you find any one or more of them continue wet while the others drain off well, examine the ball very carefully; there will be found something wrong in the draining. The sides of the ball or surface of earth should be half an inch below the edge of the pot, when they are in twenty-four sized pots, although the collar should be even with the top. These instructions should be followed from time to time every change of pot that is made. Greenhouses in which plants are placed in summer time, should be very slightly shaded with thin canvass during the burning heat of the sun, but not in the early and late periods of the day; and it is quite impossible to give too much air. There is a notion that placing greenhouse plants in the open air is bad for them, that it turns their foliage rusty. The mistake is, that plants in the open air never get so well attended; they are wet as rain will make them, for a week together if the rain lasts so long, and only get their periodical watering in the hottest weather, without any regard to whether the sun is blazing on them all day, or the damp and clouds keep them from enjoying a single ray. It is the extremes of heat and wet, and cold and dry, upon the soil they are in, and not upon the foliage, that causes the damaged appearance. It is "death in the pot" causes the damage on the plant above; when, therefore, plants are to be out of doors, they ought to be plunged in some medium to prevent the sun reaching the side of the pot. For the want of any thing better to plunge them in, make holes in the earth itself deeper than the pot requires, put stones in the bottom, lime stones better than any other, or common rough stones and some slacked lime at the top of them; this is an effectual bar to worms which disturb plants

very much, and change the character of the soil. Thus plunged, they may have here all the air and all the sun, nor will a moderate or even a large quantity of rain injure them, only do not forget you have such plants to look after, and remember it is quite possible for a plant to want water in the midst of a wet season. I lost the finest *Erica* I ever hope to possess, for the want of water at the end of three weeks wet season. The fact was, the plant was splendidly bushy, and in the hardest three hours rain scarcely a drop could reach the pot; plants, therefore, in the open ground, require as much examination, as much care and attention, as plants in a house, and those who fail in this must expect rusty, shrivelled, discoloured, burned up (as it is erroneously called,) foliage. Therefore, having chosen a sheltered spot, that is to say, sheltered against east and north-east winds, plunge the pots to the rim, provide three or four inches of gravel or clinkers, or other drainage, and a good inch of lime stones or lime, and every day go and look at them as if they were in the house, pull them up out of their holes every now and then, to see whether the roots appear at the bottom of the pot, turn out the balls occasionally to see if the roots are matting on the side; and never, as you hope to grow them well, allow twenty-four hours to go over without seeing that they have water if they require it. Continue to take the tops off every branch the instant it is long enough for your idea of shape, recollecting that every one so taken off will throw out laterals or side shoots, by these means you will keep the most unruly wandering plant short and bushy. The plants will make fresh shoots every year, and if grown hard, which, however, answers no purpose, twice in a year; and such plants as *Hovea*, *Epacris*, and *Cosmelia*, which is very near, the habit of *Epacris*, will shoot eighteen inches or two feet; nothing but taking out the top bud of each shoot will prevent this; and by these means you may get three distinct growths of three or four inches; by stopping a shoot as soon as it is three inches long, it may only send out one or two side shoots, and those near the end; stopping these at three inches, and they will do the same, so that the actual branch which would have gone up eighteen inches or two feet, as a single stem may sometimes be made by stopping only three times, to form a dozen branches shorter and more beautiful. In short, a plant may be managed to form any shape. When you have grown a plant to something like the form you want it, and large enough to make the flowering of it your object, shift no more, pay attention to the watering while it is making its growth, and still pinch out the buds of any shoots that are likely to make too much length,

though the object of not shifting is to prevent too much growth, and in this controul lies the beauty of the often-shift system; you can stop your plant at any size you like, and by curtailing its nourishment stunt its growth. I have seen a *Camellia* that has bloomed nine years in a thirty-two sized pot, and there are many heaths that have been pretty nearly as long in their habitations; the only thing to mind in these cases is, that they require the more attention, for the least neglect will starve or kill them. There is nothing according to my mind so ugly as a plant grown on the one-shift system, that is, if I judge by the naked looking stems of *Epacris*, *Erica*, and many others, where the growths have been so rapid that the foliage instead of being close and handsome, is wide apart and ugly: whereas the constant checks which plants in ordinary cultivation can have given to them, keep them so completely under controul, that you may do just what you like with them. Now, the *Hovea*, *Epacris*, and *Cosmelia*, ought not, while young, to be allowed to make a shoot two inches long before the end buds are pinched out, the others may be allowed a little more liberty, but not much. In the winter time it will be found that the plants will not want water for days together, but without your knowing why, they will at other times require it much oftener. The greenhouse for all this tribe ought never during the whole winter be allowed below 35, nor more than 50, and it is always better to mat the house than light a fire, for when fires are lighted of a night to keep out frost, the order of nature is reversed and the plants are the worse for it, they can bear heat in the day better than at night, yet in winter time, when we are threatened with frost we are too apt to make the lighting of the fire a mechanical operation. I may resume this subject by mentioning some of the more showy, but not more elegant greenhouse plants; but I can imagine six plants picked from the foregoing nine would make a beautiful exhibition if well done, and I recommend everybody who has a greenhouse to buy such of the nine genera I have mentioned, and such of the varieties as they have not got, because they are all beautiful, all will do with the same treatment, and by the contrast of their flowers afford the most gratifying show of colours and foliage in a small greenhouse, or even a common garden frame.—AN OLD CONTRIBUTOR.

#### INJURIOUS INSECTS.—No. 1.

The Common Cockchafer, Jeffery-cock, Jack Horner, or May-bug, *Melolontha vulgaris*.

THE cockchafer abounds in England and Ireland; but appears to be of rare occurrence

in Scotland. In our own country they do not appear in great numbers every year, but about every third year.

The female, when ready to lay, digs a hole in a meadow or corn-field, and at the bottom of it deposits her eggs, which are of an oval shape, and a pale yellow colour.

The grub, as soon as hatched, fixes itself round the root of a turnip, or of a plant of wheat, rye, &c., and soon causes it to wither and die, and it then moves off to some other. When about to cast its skin, which it does three or four times in its life, it goes deeper into the ground, where it forms a burrow, to afford it better accommodation meanwhile. In winter time it also remains at a depth in the earth, in a state of torpidity and abstinence from food. By the third autumn of its existence, it is ready to transform into a pupa or chrysalis, and then it burrows into the earth to the depth of about three feet. The pupa becomes a cockchafer in January or February, but it does not acquire its proper hardness and colour for ten or twelve days, and does not quit the earth to fly about until May, in the evenings of which month it may be seen dashing itself about in the air as if blind. In the day time it conceals itself under the leaves of oaks, elms, limes, maples, sycamores, vines, and other trees.

Rosel having obtained some newly-hatched grubs, and placed them in a vessel half-filled with earth, and covered with a grass turf, found that, in the following May, they fed so voraciously that they required a fresh turf every other day; and even this supply not being sufficient to satisfy them, he raised a crop of peas, lentils, and salads, in several flower-pots, and put a couple of grubs in each of them. As the grubs live three years in the earth, they do very great injury, burrowing between the turf and the soil, and devouring the roots of grass and other plants. The roots being thus eaten away, the turf may be easily rolled up, as if cut by a spade, and the soil below, for an inch or more in depth, is like soft garden-mould. Mr. Arderon, of Norwich, mentions his having seen a whole field of fine flourishing grass so undermined by these grubs, that in a few weeks it became as dry, brittle, and withered as hay. In 1736 they so greatly abounded on a farm at Heathal, five miles from Norwich, that the farmer gathered seventy bushels of them from off his trees. For the next four years the damage they committed did not amount to as much as two pounds loss; but his neighbours, not having followed his example, suffered from them to a great extent. In 1740 they appeared again in plenty, and he gathered eighty bushels. In 1744 he neglected to gather any, owing to illness, and the consequence was that they laid

their eggs, and the grubs from these, in the second year, injured his property to the extent of above one hundred pounds. In compassion for his misfortune, the city of Norwich allowed him 25l.

From the preceding facts in its history, it will be evident that to effectually prevent the ravages of these most destructive insects, we must wage war with them in both the earth and the air. To destroy the grubs in the earth soot has been thrown upon it, but without any success; a disappointment which I think might reasonably have been expected. "When a field is once over-run with them, nothing," says Rennie, "can be done with it, except paring and burning the surface, or ploughing it up, and turning in a flock of ducks or other poultry, or a drove of pigs, which are said to eat the grubs, and fatten on them. Drenching the field with stable urine, by means of reservoir carts, like watering carts, would, if sufficiently done, both kill the grubs and beneficially manure the land." — *Insect Transformations*, p. 229. "It is the practice of the farmers in Normandy to employ women and boys to follow the plough, and collect these destructive grubs in baskets. They throw the grubs thus collected into the nearest ditch or cart-rut, it being unnecessary to kill them, as they cannot make their way again under ground. I saw many bushels of them collected in the vicinity of Havre de Grace in 1830." — *Baxter's Library of Agricultural Knowledge*, 1832. But the easiest means of lessening the numbers of these grubs consist in farmers affording protection and encouragement to the rooks, and letting these birds have, if they must, their trifling portion of grain as the just reward for their valuable services in destroying millions of voracious grubs, which, if left to have their own way, will not let either man, bird, or beast reap the fruits of the earth. If we look to those counties where rooks are most persecuted, we shall find that the cockchafers and other insects destroy nearly the whole of the crops in the fields and orchards; while in the other places, where these useful birds are allowed to be plentiful, as at Clitheroe, in Lancashire, ravages from cockchafers are unknown.

Immediately that the cockchafers make their appearance above ground, it would be well to employ a number of children to collect them, that the insects may be destroyed before they lay any eggs to ensure another generation. A good, but rather laborious plan, is to beat the insects off the trees in the daytime with long poles, catching them as they fall in a sheet held or spread underneath the branches. The quickest and the surest way of killing them is by burning.

J. H. F.



## A FEW GOOD PERENNIALS,

*In addition to those mentioned in Practice for May.*

**MONKSHOOD.**—Of the common purple very little good can be said; it is a dull object at the best: but there is a variegated kind, more dwarf in its growth, much more abundant in flowers in proportion to its foliage, and therefore worth a place.

**HOLLYHOCKS.**—The varieties are already almost endless. I should recommend the purchase of about twelve double ones of different colours; and when they flower, save one pod of seed from each and no more; mark the handsomest flower for sowing, and cut off the pods of the other flowers as fast as they decay. If you buy them, plant them all in one situation, near one another in rich ground; but if you can get a good pinch of seed sow it this month.

**POPPY.**—The Oriental is a striking flower, and may be seen half a mile off, though it is not long in bloom; a plant of this, and one of *Papaver Alpinum*, may be worth the room they occupy.

**GENOTHERA.**—There are but three perennial kinds worth having, *Æ. Macrocarpa*, *Æ. Taraxifolia*, and *Speciosa*, and they are hardly worth raising from seed; the others, which may be had in plants or seeds may be comprised in the following:—

**CALAMANCHE CÆRULEA**, (blue) and bi-color, (blue and white.)

**CISTUS**, or the rock rose, many varieties, red, yellow, orange, &c., and mixed seed may be had.

**GENTIANA ACAULIS**, blue, one of the most beautiful and brilliant blue flowers grown, habit of the plant dwarf; flower, bell-shaped, but long and partly erect instead of drooping, height about three to four inches.

**IRIS**'s, which may be raised in great variety from seed.

**LYCHNESS**, the double scarlet.

**PONTINTILLA HOPWOODIANA** (salmon colour), and *Russeliana*, (scarlet.)

**VIOLETS** should be had in collection, double purple, double white, and double pale blue, and the Russian, which may be raised from seed.

**HEPATICAS**, the most beautiful of spring flowers, double red, double white, double blue.

**CYCLAMEN**, which may be raised from seeds, at least such as are hardy.

## WINDOW GARDENING.

THERE is nothing more important in a metropolis like that of London than the management of plants in pots, for at present nothing is more certain in a general way than the speedy death of the very best that comes into the market, yet nothing so ornamental to a

good house, as good plants in the window. The plants which come to the London market, are, it is true, usually at their best; they have been carefully grown according to rule, their watering has been regular, the soil properly adapted to their habits, the pots in which they have been grown are of suitable size, and the heat, and air, and light have been as well regulated as skill could suggest. The transition from all this regularity to the tender mercies of the purchaser is felt the first twenty-four hours, and the effect is often seen in that short period; drowning or starving is no uncommon fate, they are taken home, put into plates or tea saucers, deluged with wet and left standing in it; or, they are put in some conspicuous place and left to their fate without any notice at all. In the former case the leaves turn yellow and fall, the blooms drop, and in the course of a very short time the naked stumps with little tufts of green at the top or ends of them are all that can be seen of the plants, which, comparatively, a few hours before were in perfection; in the latter case the plants droop and die with all the leaves and bloom upon them. Nearly all the evils attending plants in London may be traced to these two causes; but there is a good deal to be said as to the state of the plants when purchased. Some plants are in their nature short lived, they are grown and blown only to sell, and with all the care in the world they could not be saved long. For instance, thousands of pots of tulips are sold in the London market full blown, if these were at home in their nursery they could not last long, a very few days would see them fade even in the hothouse or other place where they bloom, these are a kind of plant which might be grown in the darkest street in London, so also might hyacinths, crocuses, and many other bulbs; these then ought to be so grown because they are interesting in all their stages of growth, and those who only buy them when in flower, lose nine-tenths of their value. Even the first portion of bloom, the very first flower that shows its colour has a charm about it, and therefore should be possessed from the first. The great supply, however, of flowers, consists of stocks, mignonette, wall-flowers, cinerarias, camellia japonicas, roses, polyanthus, auriculas and geraniums; these are for the most part more or less forced, and the very change of temperature, from the heat of a forcing house to the cold of the common atmosphere is enough to destroy their beauty. Stocks and mignonette are generally kept through the winter in frames, and tens of thousands are treated alike till they are fitted for market. Now both of these are hardy in the open ground when they are not forced, but when

brought forward for the spring market, they are naturally tender. It happens in most cases that when they are bought they want water, but it is easily seen whether the soil is wet or dry; when, therefore, they are first brought home, they should be refreshed with water, and every drain that runs through the pot should be thrown away, the saucer ought not in fact to be even damp, the plants may then be placed at the window, which in mild weather should be open, but shut if the wind be very cold; while the soil in the pot is moist no more water should be given, and when it is dry enough it should be supplied as at first, and the refuse water thrown away. In this manner they should be attended to from the time they are purchased; never to be allowed to get thoroughly dry, nor to stand in water, nor be wet long together. But the plants which suffer most, are the heaths which require more air than any other, camellias which drop all their blooms on any sudden change of temperature, and hard-wooded plants such as *epacris*. It is far better that they risk a trifling frost or cold wind than that they be shut up close in a room, and more especially if there be a fire in it. It may be taken, however, as a general rule, that no plants like too much water, and if they stand in a wet saucer they have too much, unless they are in the patent pots which have feet on purpose to keep them above the wet, or are placed in patent saucers which sustain them above the water which runs through. The following may be adopted as very general rules, and although more absolutely necessary to some plants than to others, very good to all.

1.—Never to water them while the earth is moist under any circumstances, but only when they are getting dry on the surface generally, this is not above twice a week in winter, every other day in spring and fall, and every day in the height of summer.

2.—To give them plenty every time they are watered and allow it to run quite away from them, so that the bottom of the pot shall never stand in the water, nor even on the wet bottom of the saucer; but that whatever they stand in shall be dry.

3.—To use river water where it can be had, and if it be necessarily spring water, to let it stand in the air a day before using.

4.—To give air every possible opportunity either by putting them outside the window or out in a balcony in mild weather, and if in the burning sun to recollect that the pots must be shaded if the plants are not, as the heat of the sun on the sides of the pot would dry the fibres and greatly injure the plant.

5.—To recollect that plants actually in bloom would be greatly hastened out of bloom by exposing the flowers to the sun,

as is the case even with plants in the open ground.

6.—To keep plants as far from the fire as possible if there must be a fire in the room, and as near the window as possible, unless the frost is severe, when they are better near the middle of the room.

7.—To keep the rooms where plants are as nearly of an even temperature as possible.

8.—To water them all over the foliage frequently in the summer time, but only at the times when they require watering in other respects.

9.—To examine them occasionally to see if the pots are full of roots, and if so to either get some soil of the nurserymen you buy of, and put them in pots a size larger, or to be more watchful that they are never too dry, and let them take their chance of living which is doubtful, though many flowers are not worth the cost of a new pot, nor the trouble of getting the mould that is proper.

In buying plants there is a good deal in a good choice. For however gratifying it may be to have those which look best, it is most pleasing to have those which last longest in perfection. Geraniums last a long time in perfection, so do the hydrangia, mimulus, myrtle, cineraria, heartsease, fuchsia, *correa*, verbenas, petunia, and many others whose blooms come all the summer, or at least come as fast as the plants grow. *Camellia japonica* may be selected with a number of buds in different stages of forwardness so as to last a reasonable time, but many of the plants brought to market are kept in the nursery till they are in perfection, and then from the moment they are bought they get worse every day, and would even in the gardens where they are raised. All such plants, therefore, ought to be bought before they are in bloom, before they have opened fairly, and to do this you must perhaps go to the nurseries instead of the market, for they are better worth twice the money they cost at market when well selected at the nursery if it be only for remaining in perfection more than twice as long. Those plants whose blossoms are coming the whole season, may be found quite good enough at the market. Upon the whole if the good people in close rooms could but give their plants more air, less water, and that more regularly, they would prolong their beauty always and their existence very often.

#### IMPROVING THE CABBAGE, AND IMPORTANCE OF SPROUTS.

WHEELER's Imperial Nonpareil, Imperial Wellington, and the Poltmore, may be sown in every month, from the 25th of February to the 25th of July, to produce heads or sprouts throughout the year.

Cabbages, cauliflowers, broccoli, lettuces, &c. ought to be sown on beds not wider than four feet, to avoid pressing them with the hand or foot in weeding, &c.; the beds should be watered in very dry weather before sowing, and the seeds covered with sifted earth to the depth of a quarter of an inch, upon which should be placed wood-ashes in summer, to keep off birds and insects, and render the surface moist; and sifted coal-ashes in winter to protect them from the frost.

The plants ought not to be removed into nursery-beds, which would retard their growth; but they should be placed finally from the seed-beds in succession into drills, to have one earthing only; and then the ground between the rows two feet wide, must remain quite flat, that the air and rain may reach the roots, which would not be the case if the plants were again moulded up in the old-fashioned way, as that diverts the rain from the roots; flax-dust, or sifted ashes mixed with lime, should be placed in the drills between the plants, to keep off insects, and as a manure; and the drills must be moistened with liquid manure or pure water, just before the earthing takes place, to secure the moisture. This method applies likewise to celery, peas, and other plants; the ground between the rows two feet wide must be occasionally dug, to cause insects and their eggs to rise to the surface, that they may be destroyed by the birds and the gardener, to bury the weeds, to admit air and rain to the roots of the plants, and so fertilize the soil.

When the head of a cabbage has been removed, the stalk, with its four or five upright young leaves, should be left in the ground, to produce at the base of each leaf a head in the summer, and a shoot late in the autumn and winter; which shoots, being suffered to grow their full length, will produce a great many sprouts, of which some may be taken off for table use whilst they are in full sap; and others, with pieces of the old shoots at their bases, for planting in moist ground during showery weather, to produce heads or sprouts; the rest may be left to seed in July or August.

This may be done when the ground is not wanted for other crops; but when that is the case, the stalks, with their upright young leaves may be removed during showery weather into any waste place in the field or garden.

As each sprout will have two small leaves at its base, to raise sap for their mutual benefit, so the original upright leaves will then have decayed, and they must be removed.

As the leaf acts like the sucker of a pump, to raise the liquid called sap, which has been collected by the roots, and the sap, in its progress upwards to sustain the leaf, will support the bud at its base, so the cutting off the leaves

and letting the stalks remain bare, must greatly retard the propagation of heads and sprouts; and it would also be well, during November, to tie their leaves, and those also of broccoli, when thoroughly dry, rather loosely over their heads, to protect them from rain, snow, cold winds, and frost; and over the heads of cauliflowers, cabbages, and lettuces, in summer, from the scorching rays of the sun.

It would be well to make the experiment of planting, in autumn, two or three dwarf York sprouts, in the centre of a circle ten inches apart, and to plant round them three or four sprouts of Wheeler's or the Nonpareil Imperial, or of any other quick-heading cabbage, and to let them remain in the ground to produce seeds in August, which must be sown immediately, in the expectation that an improved variety would be formed, possessing quicker growth than the larger sort, and a larger kind than the dwarf York.—B., *Salisbury*.

#### AMERICAN CIDER APPLES.

145. *Black, or Virginia Red Streak*;—striped, medium size, second quality, autumn, very productive, an esteemed southern variety.

146. *Buck's County*;—medium size, Dec. to Feb. very productive, a Pennsylvania variety.

147. *Campfield*; red and yellow, oblate, medium size, first quality, Sept. to Jan. very productive, firm, sweet and rich.

148. *Cann*;—pale green, and red, conical, medium size, first quality, autumn, very productive, much esteemed in New Jersey.

149. *Cooper's russet*;—pale yellow, oblong, small size, first quality, Nov. to March, very productive, used also for cooking.

150. *Granivinkle*;—dark and red, oblong, medium size, first quality, Nov. very productive, rich and very sweet.

151. *Harrison*;—yellow, oblong, small size, first quality, Nov. to April, very productive, one of the most esteemed.

152. *House, or Grey-house*; green and red, oval, small size, first quality, Oct. to Jan. very productive, good also for table.

153. *Roan's White Crab*; yellow and brown, round, small size, first quality, Sept. to Jan., rich and musky.

154. *Virginia Crab*;—red and yellow, globular, small size, first quality, Oct. to March, very productive, an esteemed southern variety.

155. *Taliaferro*, striped, white and red, flat, medium size, first quality, Sept. very productive, fine southern variety.

156. *Wetherill's White Sweeting*;—pale and yellow, roundish, September, very productive, a sweet variety, used also for desert.

The above Apples are given as the most

suitable for Cider, and complete the catalogue of American Apples spoken of in our earlier numbers.

#### NOTES AND COMMENTS.

**CULTURE OF THE CARROT.**—Some gardeners imagine that old garden soils are not favourable to the growth of Carrots; but I have produced them in two old gardens, which for years had refused to produce them by the common modes of cultivation. The system I pursue is this: in autumn the ground is trenched to the depth of eighteen inches; in the bottom of each trench a little quick-lime is sprinkled and forked up with the bottom; the surface remains quite rough until spring; previous to sowing, a little river-sand or sandy earth is spread over the surface, and dug in as deep as a common spade will do it; I then add a little more quick-lime, and rake the surface level; the beds are then formed; drills are drawn in the usual way; the seeds, being mixed with river-sand, are then sown, and covered in with the back of a rake. The width of the drills varies according to the sorts; for small-growing kinds, such as the Early Horn, eight inches is about the width; for the Altringham, ten inches; and for the largest sorts one foot is not too much; and they are thinned out to about the same distances in the drills. Thinning is of the greatest importance: the allowing teem to remain too thick is not unfrequently the cause of disease. By the above system, I produced last year on one hundred and twenty square yards nine cwt. of tops, all perfectly free from speck, the sort being the Altringham.—*P. Elliot.—Chronicle.*

[Having seen a good crop of Carrots brought in almost all kinds of ground, there is nothing surprising in this; but we have brought a good crop where there was not all over the garden more than nine inches depth of mould over a bed of hard sand and gravel. We marked out a four-foot border, and then four feet for a path, and trenched out nine inches of gravel, which we put in the path, while the nine inches of soil we put on the border. By this means, we had for years good Carrots of both Early Horn and Altringham, and sowed broad cast. All the dressing ours wanted was dung from a melon-bed; and we reckon our four-foot border and four-foot path, though extravagant, brought us much more and better crops than ever the eight-foot did as we found it.]

**GENTIANELLA.** (*Gentiana acaulis*).—This is seldom seen to flower well, and doctors differ much about its treatment. I made a little square bed, in 1840, in which I planted twenty good-sized bunches, with good balls of earth attached to each bunch. They have flowered well every year since, and have been much admired by all

who saw them. At the present time, there is upwards of 350 blossoms upon them; the situation is very low, so that we lose many perennials in damp winters. The soil they are grown in is half common garden-mould, which is very light, and half loam and leaf-mould, such as comes from an old melon-bed; and every year the bed is top-dressed with loam and leaf-mould, in fine weather, in February or early in March. Neither spade nor fork is used among them, but when a weed appears it is taken away, and the top-dressing is done carefully between the plants.—*Winchester College Gardens.—Chronicle.*

[This plant is often very gay at the Chiswick Gardens, where it forms an edging to one of the principal walks, and generally it flourishes when it is not disturbed.]

**BUDDING AND INARCHING THE VINE.**—Wishing to increase the number of Muscats of Alexandria and Cannon-Hall Grapes, I cut down a few Vines; one-half of them was budded, and the other inarched. To test the merit of each method fairly, both budding and inarching were done at one period. The result is, that by the former method, bearing wood has been produced nearly double the strength of that by the latter. In budding, the following is the method I pursued:—The old Vines were cut down in the autumn of 1842; they were laid in March, 1843; as soon as they had made shoots a few inches long, two were selected on each Vine, and all the others were taken off. These were tied in, and laterals were pinched regularly off them until May. The young shoots were then about two-thirds up the rafters, and nearly full-grown in thickness at the base, but not ripened or turned brown. At that period the buds taken from young shoots with leaves not larger than two inches in diameter, were put on: the wood was left in the buds; they were inserted in the usual way, and tied firmly with a piece of matting. In the course of ten days or a fortnight they were united, the matting was undone, and the shoots were cut down to the buds; all shoots below the buds were taken off as they made their appearance. After this was done they grew away very strong and rapidly. Some of the buds showed fruit, but this was pinched off. The leaves attached to the buds never flagged.—*W. G.—Gardener's Chronicle.*

[All this might have happened from nothing but the bad inarching. And, in the first place, the season was as bad as it could be for inarching, while it was as good as it could be for the budding. In our Treatise on the Vine out of Doors there is a direction how to inarch properly (pages 5 and 6 of the current volume); and it ought to be referred back to by anybody who would know why this inarching was not so successful as the budding. The inarching ought, in fact, to be performed when both the

shoot of the Vine and that of the inarch should be not thicker than a quill.]

**TO PRESERVE HEDGE-BILLS, SCYTHES, SICKLES, AND OTHER STEEL INSTRUMENTS, FROM RUSTING,** wipe them quite dry, heat them sufficiently to melt common bees'-wax, and then rub them over with it so as to cover the whole of the steel with a thin coating. The wax completely excluding the air, prevents any decomposition from taking place on the surface of the steel: and when the instrument is wanted for use, the wax is readily removed by the application of heat.—*Frank. Jour.*, vol. xxii., p. 359.

[This is so complete a preservative, that since the use of steel instead of copper plates, for the most costly engravings, although a plate may be worth a thousand pounds, and the smallest rust would destroy it, no other remedy is applied. As soon as they are done with for a time, they are warmed, and rubbed with bees'-wax, and then left for months with no other preservation.]

**SPECIES OF DAHLIA.**—The recorded species of Dahlia are only five in number; viz., *D. variabilis*, *D. Cerrantesii*, *D. coccinea*, *D. Barkeria*, and *D. scapigera*. Although we have adopted the specific name of the latter, we are by no means satisfied with the correctness of the term *scapigera*, scape-bearing; the flower-stalks being, according to correct botanical language, peduncles, not scapes, the latter term being applied to such flower-stalks as arise from the root and do not bear leaves. A more appropriate specific name would have been *diversifolia*, in allusion to the variable form of the leaves. It is in the collection of the Birmingham Botanical and Horticultural Society, by whom it was received from the Royal Garden at Berlin.—*Smith's Cabinet*.

[We have seen this fancy for calling every foreign variety a species pretty well knocked on the head. Among this very tribe there might be found a hundred varieties in one batch of seedlings, differing more from each other than these five foreign kinds which are distinguished by botanists as distinct species; and if there should happen to be new seedling varieties of *Camellia Japonica* introduced from China, the first species manufacturer that gets hold of them to figure, will dignify them, as usual, with the title of species.]

**TO DESTROY THE WORMS ON LAWNS.**—Roll the lawn twice; then water it with lime-water of the following strength:—One pint of unslacked lime to ten gallons of water; two dressings of this liquid will quite destroy them without injury to the grass. If you wish to bring the worms to the surface, water the grass with the following solution:—A quarter of an ounce of corrosive sublimate to three gallons of water, this will bring every worm

to the surface without destroying the grass.—*Gardener's Gazette* of 1839.

[This was published so long ago, and remained without contradiction, that one would feel inclined to adopt it, but whether it be good or harm to use lime-water, it makes the grass look very ugly for a time, for the water, however clear, dries white.]

**IVY.**—Of the virtues of ivy little is known. Some assert that it prevents intoxication; and hence it entwined the brows of Bacchus to keep off the fumes of wine. Cato directs that it should be given to cattle when other fodder was scarce; and we have known it given to sheep with apparent advantage at a season when the snow had buried other green food. When ivy is trained to a stake, and suffered to form a head, it becomes one of the most ornamental of all the evergreens.—*Garden Newspaper*.

[The great singularity of ivy, however, is in the fact, that it never blooms while flat on a wall, but as soon as it has reached the top, throws its branches about in the wind, it blooms, and bears its berries in abundance.]

**ADVANTAGE IN PLANTING LABURNUMS.**—Hares and rabbits are so remarkably fond of this tree, that they will touch no other plant while a twig of it remains. Hence it has been suggested to sow laburnum seeds in plantations where these animals abound. The young trees will at first require protection, otherwise they will bark them. Though eaten to the ground in winter, this tree will spring up again the next season, and thus constantly supply food for this kind of game. A small sum laid out by a farmer in this seed, and judiciously sown in his hedges or coppices, would save his crops and other young trees.—*Gardener's Gazette*.

[How would the farmer come off after having drawn all the hares and rabbits to his neighbourhood, when these deciduous plants dropped their leaves and ceased growing for the winter?]

**EFFECTS OF WATER ON VEGETATION.**—That vegetables will grow in woollen cloth, moss, and in other insoluble media besides soils, provided they be supplied with water, has been repeatedly shown since the days of Van Helmont and Boyle; but the experiments of a modern author, from their apparent correctness, seem highly interesting and conclusive:—Seeds of various plants were sown in pure river sand, in litharge, in flower of sulphur, and even among metal, or common leaden shot, and in every instance nothing employed for their nourishment but *distilled water*. The plants thrive, and passed through all the usual gradations of growth to perfect maturity. The author then proceeded to

gather the entire produce, roots, stems, leaves, pods, seeds, &c., they were accurately weighed, dried, and again weighed, submitted to distillation, incineration, lixiviation, and the other ordinary means used in a careful analysis. He obtained from these vegetables all the materials peculiar to each individual species, precisely as if it had been cultivated in its natural soil, viz., the various earths, alkalies, acids, metals, carbon, sulphur, phosphorus, nitrogen, &c. He concludes this very important paper nearly in these very extraordinary words:—"Oxygen and hydrogen, with the assistance of solar light, appear to be the only elementary substances employed in the constitution of the whole universe; and nature, in her simple progress, works the most infinitely diversified effects by the slightest modifications in the means she employs.—See "*Recherches sur la Force assimilatrice dans les Végétaux*," par M. Henri Braconnot, *Annales de Chimie*, Fev. A. Mars, 1807.

[So much for the doctrine that we must return to the soil, that of which plants are composed, and, therefore, take away from it; here is a strong confirmation of a fact insisted on by some practical men, that plants depend as much on the air and water as on the earth, and that it is impossible to calculate how much they take from one, and how much from the other.]

**CHARCOAL.**—In the Forest of Dean I observed that the Charcoal "hearths or floors" soon became spontaneously covered with seedling willows, of a very vigorous growth. These seedlings made their appearance in about a year after the fires, and I do not recollect any other kind of seed germinating there except the willows. In this forest there is a kind of blue shale over the stratum of coal, this after being exposed to the atmosphere for some time crumbles down like shell marl. Mounds round some old coal-pits composed of this material were planted with oaks, which became the most vigorous of any in the forest, and were covered with healthy dark-green shining leaves. The coal shale is a valuable manure and would be useful to farmers, particularly upon light sandy heath and bog soils, and in localities where it abounds the proprietors of coal-works might profit by it.—*W. Billington, Oswestry, Salop. (Chronicle.)*

[The greater portion of charcoal is made of willow, and, consequently, as it is lighter when manufactured than before it, the burning is generally conducted where the willow is cut, the probability is, that willow seeds abound in the earth, clearing the place, or the effect of so much charcoal, (which we know is favourable to vegetation) may cause the seeds in the ground to grow, but we will engage that any body may burn charcoal till their

heart aches without making a willow grow where willows have never grown before, unless they sow the seed.]

**EMPLOYMENT OF MINERAL TAR FOR WALLS OF MASONRY OR OF MUD.**—When the Walls are thoroughly dry, towards the end of summer (having previously been either newly built or put into a state of thorough repair), they are to be coated over, once, twice, or thrice, with the tar. The last coat, immediately when put on, may be powdered with sand; and this, when solidified, may be whitewashed. In France, earthen walls, and the walls of courtyards and terraces, are treated in this manner, and so rendered of great durability.—*Annales des Ponts et Chaussées.*

[The practice of sanding after paint has long been prevalent in England, and well done, in wood-work, gives it the appearance of stone. Sand may also be an additional preservative to paling after tarring; but masonry, we opine, wants no such assistance, however much it would improve mud.]

**PRESERVING SPECIMENS OF PLANTS, OR OF ORGANIC SUBSTANCES GENERALLY.**—Dr. Riddell, of Louisiana, has found that, by wholly extracting the moisture from the specimens to be preserved, which he does by means of unslacked lime, and then enclosing them in hermetically-sealed cases, they may be exposed to the light without in the slightest degree losing their colour. By carefully surrounding fresh specimens of *Rosa gallica* with fine powder of quick-lime, in a close tin box, complete desiccation was accomplished in a single day; and the flowers, when taken out, were found of their natural shape and colour, but stiff and brittle from dryness. The rose, or other flower or plant, insect, &c., so dried, is next put into a case (like a wax flower), with a pane of glass in front, and the whole closed by means of putty, so as to be perfectly air-tight. Specimens of insects, fungi, fruits, &c., are effectually embalmed in this manner; but the most practically important part of the discovery to the botanist is, that cacti, and other succulents, may be perfectly dried in a few days, and afterwards deposited in cases with glass fronts, with their form and colour perfectly preserved. The details at length are given in *Silliman's Journal*, vol. xxxv., p. 338.—*Gard. Mag.*

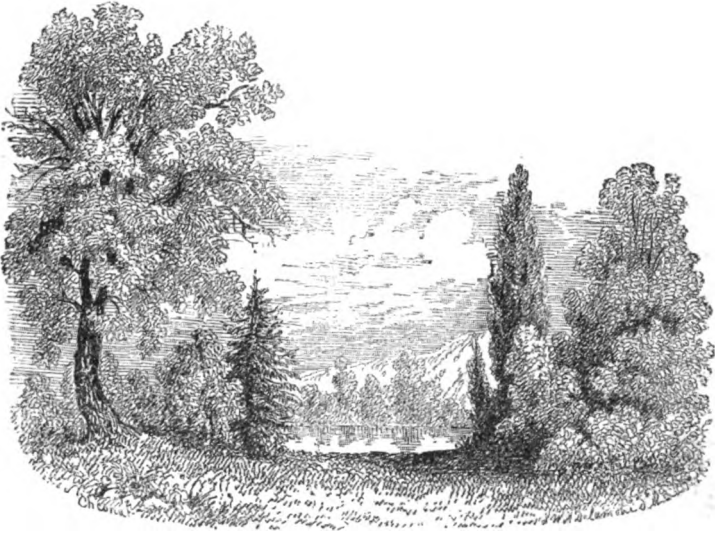
[This is too good to be true, or else we are too clumsy to accomplish it; what is called "carefully surrounding" we hardly know, but our experiments were very unfortunate, and the specimens were shrivelled. Perhaps the lime ought to be kept at a respectful distance. Some of our correspondents may exert their ingenuity, or we must get the details and publish them.]

**HARDY HEATHS.**—A Correspondent of the

*Chronicle* observes that Heaths will grow in any ordinary garden-soil, and that it may be removed at any season.—He also states that he has pulled up young plants from their natural bed in all seasons, and larger plants in flower; all of which succeeded perfectly in the garden; and that the flowers are as brilliant as if they were produced on their native wilds.

[The ground may sometimes be so soft and yielding, that a root of Heaths might lift

without much damage, and if it were a dripping wet season it might escape; but if any one pretend that the Heath will suffer such treatment with impunity, he will be misleading nineteen people out of twenty who shall venture to try it. This correspondent's feat was an exception, if all he says be true; but let not those who dislike dead Heaths try to remove them, except when their roots will leave the ground without breaking, nor try it in any but light porous earth.]



#### THE GARDENER'S SKETCH BOOK.—NO. II.

ROUGH as these little sketches of scenery may be executed, there is enough to show particular effects that are useful to the landscape gardener, and again we recommend every body who can handle a pencil at all and draw sufficiently well to understand a thing himself, to make a point of copying any little bit of scenery that may strike him as pretty and effective in his travels. In the above there is nothing remarkable except the mere contrast

of foliage, coarse though it may be, there may be seen very distinctly the effects of the Chestnut, the Larch Fir, the Cypress and the Thorn, and it affords a very good example of the advantages of mixed foliage. Of itself it may appear a very unimportant sketch, but as one of many very different from each other we regard it as possessing some interest, and shall occasionally add others from the same prolific source.

#### FRENCH CULTURE OF PEACH TREES.

FROM the days of Girardot, the life-guardsmen, who ruined himself by his experiments in the service of Louis XIV., until 1817, when the Comte Lelieur de Ville-sur-Arce, then administrator of the Royal Parks and Gardens, published his *Pomone Française*, it was the general opinion that the inhabitants of Montreuil\* had attained the highest perfection in pruning the Peach, and in giving it the best possible form

for bearing. From the period alluded to above it is certain that the inhabitants of this village have always better cultivated this tree, and given it a better form than other gardeners. For more than 200 years they have put in practice the principles which Girardot had discovered, and have followed them up with such regularity and uniformity, that it would seem, on looking through the thousands of gardens at Montreuil, that all the Peach trees had been pruned by the same hand. However, whilst admiration must be excited by the sight of these fine trees, pruned for upwards of two centuries in precisely the same manner, it is impossible not

\* A small village close to Paris, famous for its peaches. It is the fashion in the summer time to make parties of pleasure to go there and eat the fruit.

to regret that so great a space is left in the centre and below the two sides. That the wall ought to be covered entirely by the tree which it protects, is the general idea; and the only excuse that could be suggested in this case was, that the Peach tree was of a stubborn character—not yielding to the care of the horticulturist—and that, therefore, the form which had been given it for so long a time was the result of the best experiments, and the most patient researches.

Matters were in this state when, in 1815, M. Lelieur had the boldness to doubt of the correctness of the general opinion, and to assert that the mode of pruning at Montreuil was susceptible of improvement. At that period several gardeners of character had found that the Peach tree was not in reality so hard to master as was generally thought, and some even ventured to affirm that it was as docile as any other tree in the garden. A cultivator of Boissy-Saint-Leger, named Corby, trained the Peach tree as he did his vines, and was able to exhibit as a proof of the efficacy of his plan, four trees, which were admired by all connoisseurs. Two were placed against the end of a building, and two others against the pillars of a large gate. Never were trees trained with greater perfection and regularity; and though the range of buildings to which they were attached no longer exists, the plates of these trees given in the *Pomone Française* prove that the Peach tree cannot be an unyielding tree, but that it submits with facility to all the shapes that an experienced hand knows how to give it. It is not, however, advisable to bring up all the Peach trees in a garden in this manner, for that would require too much watching and care, and more leisure than gardeners generally can bestow; but it would be of service to the science of horticulture if amateurs should occasionally try the new method, in order to stimulate and keep up the practice.

In some gardens the Peach tree is forced to a shape called *palmette*, a shape first practised in France, but what Forsyth, the King's gardener in England, has employed and described as his own invention; so that, in fact, it is called indifferently Forsyth's cut, as well as the *palmette* cut. Many examples of this may be seen at present in the Royal Garden at Versailles, and it was formerly practised constantly by Petit-Thouars, at the nursery of Roule. Notwithstanding the advantages it certainly presents, the inhabitants of Montreuil have never adopted it; and in the whole of their district there is not a single Peach tree trained *en palmette*.

After this preamble, which it would not be difficult to extend, if it was necessary to write a history of the Peach tree, let us return to the mode of training practised at Montreuil

for two centuries. According to this method, the Peach-tree is shaped into two great wings, like those of a bird. A great vacant space remains in the centre above, and two others below; so that the three spaces often take up half the space which the tree ought to occupy to itself. Now, as where there are no branches there can be no fruit, it is difficult to imagine how the inhabitants of Montreuil—intelligent, industrious, and inventive as they certainly are in the culture of the Peach, and in various methods of obtaining the greatest possible return—could have remained so long a time without seeking for some method of filling up the three vacant spaces alluded to. At last a man sprung up amongst them who perceived this fault, and who has remedied it, by training Peach trees in a square form. This person is M. Félix Malot, jun., who, in 1832, received a medal from the Royal Society of Horticulture for his improved method. Soon after, M. Alexis Lepère, an intimate friend of his, followed in his steps, and has succeeded in training trees in a square shape, equally fine with those of M. Malot. The Royal Society of Horticulture, in 1836, also marked their sense of M. Lepère's efforts, by assigning to him a medal of encouragement. It is not for the beauty of appearance only that the square Peach trees merit a preference over the others; it is, above all, for their produce, that they deserve attention. It is frequently a third, and sometimes nearly a half greater, since the square form contains so much a greater quantity of branches than the old mode. The garden of M. Lepère contains trees seven years old, which cover each a surface of wall of twenty-six feet long by eight feet high, all covered, without any empty space. That this mode is superior to the other is manifest; and it is scarcely to be doubted that the inhabitants of Montreuil will immediately adopt it; yet they ought, in order to ensure success, to take lessons from MM. Malot and Lepère in the art of obtaining branches for replacing. These operations are not unknown in that district; but whether the inhabitants are so much occupied that they cannot devote the necessary time, or that they attach little importance to them, they are not executed as they ought to be. The new plan will introduce improvements in these practices.

#### SYNONYMS OF TULIPS.

THE following list is by Mr. Pile the Auctioneer, than whom perhaps hardly one of the growers of the old school is more experienced: many thousand of pounds worth have changed hands in obedience to his hammer, and very



few have grown a better collection. So far as the list relates to the old sorts, it is tolerably accurate, but our readers of the new school can number many names for the same tulip of modern break; and the dispersion of Clarke's fine breeders has made many a Tulip-grower, an innocent offender in increasing the names of one and the same flower. The identical variety which is named after a Tory in one bed, is honoured by that of a Radical in another; one man making kings, others musicians; a third, poets; a fourth, race-horses; and a fifth names a whole batch after favourite dancers, or popular novels; the identical flower is to be found broken in half-a-dozen different collections: the same season it is equally new to all, and each, as is very natural, names his own; hence the evil must go on increasing, without any design on the part of the growers. But the evil is increased by naming new-broke flowers, well known to have been broken by somebody else, or even by a great many others. By this time Polyphe-mus has at least a dozen names, and as some are broken every year, will perhaps have as many more. However, the following among the old ones, will help people to observe and strike out a few names from their Tulip books.

*An Analysis of the Names of Tulips, containing all the synonyms with which the writer is acquainted*

#### ROSES.

Andromache, Dutch Globertina, Strong's Globe, Cassandra, Maria Louisa.  
 Athalia, Robinet, Catharine.  
 Baccu, Bacchus, Beauté Supreme, Beauté Touchante.  
 Catalani, La Tendresse, Cerise Blanc, Pon-ceau tres Blanc, Minerva.  
 Camuse des Craix, Aldegonde de Cerise, Bathsheba.  
 Duchess of Clarence, Duchess of Gloucester, Reynolds' William, Thomas.  
 Georgius Tertius, Pearson's Fair Helen.  
 Hebe, Queen of England.  
 Mantua Ducal, Cerise Royale.  
 Maria Theresa, Surpass Reine de Hungary.  
 Pretiosa, Thunderbolt, Rose Mervelieu.  
 Prince William IV., Rose Henrica.  
 Reine des Cerises, Bartlett's Rosetta, Gurrier, Sysagambis, Iphigenia.  
 Rose Brilliant, Rose Camuse, Primo bien de Noir, Strong's Old Rose Camuse, Mon Cœur, and sometimes Bathsheba.  
 Rose, Daphne, Diana, Incomparable, Voor-helm, Premier, Noble.  
 Rose, Premier, sometimes imposed upon the un-weary and young fancier as Reine de Roses.  
 (The writer knows a fancier, who, when young, was induced to give five guineas for an offset

of it under the latter name; it did not bloom with him for several years, and when the imposition was discovered, there was no redress.)

Triumph de Flora, Domingo, Harvey's Rose.  
 Triumph Royal, Heroine.

#### BYBLOMENS.

Alcon, Grand Mervelle, Alexander Magnus, Tower of Salisbury, Strong's Lord Hawke.  
 Ambassador de Holland, Prince Sovereign of the Netherlands.

Acapulco, Charles Fox, La Pucelle Amiable, Roi de Siam, Roi de Congo.

Archelaus, Violet Antonio.

Bien fait, Beauté Virginale.

Boadicea, Duchess of Wellington, La Amite, La joi Blanc, Countess of Berwick.

Duc de Florence, Duchess of Tuscany, La Medea, European, Young Roscius, Brook's Perle de Angleterre.

Franciscus Primus, Moreau, Imperatrice Romaine, Violet delicate, Bell's Violet, La Doree.

Gloria Mundi, Gloria Alborum, Violet Perfecta, Governor General, Director General.

Grandeur Touchant, Rex Nigorum, Joyn-ing's Cornwallis, Captain Lamson.

La Fidelle Gresdeline, Quaker, Violet Hombre.

La Proserpine, Roi de St. Epagne.

La Virginite, La Purite.

La Mere Brune, Violet Triumphant, Caffee Royale, Zwart's Violet, Trephemia, Violet. Antonia.

Lady Elizabeth, La Genteel.

Louis XVI. has many tribes; a coarse one was known as Lord Cornwallis a few years ago.

Maitre Partout, Sir John England's Eringo Bragh.

Numitor Reine de Egypt.

Rein de Sheba, Mentor, Belle Irelandoise.

Violet Rougeattre, Desideratta.

Washington, Rodney.

#### BIZARRES.

Abadda, Fleur de Parade.

Abercrombie, Sanzio, Gabel's King, Gabel's Duke of York, Strong's Capt. White, Strong's Capt. Black, Strong's Admiral White, Strong's Old Admiral White.

Canceller, St. Bernard, Castrum Dolores, Catafalca.

Charbonier fin., Charbonier Noir, Austin's Emperor, Alexander, Cenotaphium.

Carter's Leopold, Croesus, Strong's No. 1.

Count Platoff, Garnett's Waterloo, Page's George IV., Strong's Charles X., Commander, Gabel's Glory.

Duke of Clarence Lawrence's, Davey's Tralfalgar, Guido.

Duke of Bedford, Carlo Dolce, Vandyke, Lady Collingwood, Earl Munster.

Emperor of Austria, Goldham's Reform.

Garrick, Shakspeare, Rembrandt, Edmund Kean.

Gordianus, Mason's Yellow, fine and black.

Hector, Ne plus ultra, Milo, Henry le Grande, Henrietta.

Jourdan, Feu Devorant, Junius Brutus, Cato, Gabel's Nelson, Earl Stanhope.

Jolly, Grand Patriarch, Sir Launcelot.

Leopoldina, Viola que surpasse. Optimus, Newton Beauty.

Polyphemus, Albion, Nouri Effendi, Surpass Polyphemus, &c. &c.

Walker's King, Andrew's King.

Surpasse Catafalque, Hait's St. Vincent, Godfrey's St. Vincent, Drinkwater's William Pitt.

The object of this article is to prevent the country growers and beginners, from paying too much attention to numbers of varieties, and too little to their value. We particularly request our friends who have beds, or who have opportunities of looking to the beds of other persons, to examine flowers thus named, and to observe the great affinity one bears to the other. Those who grow under the larger number of names, may show Abercrombie, Sanzio, Gable's King, Captain White, and the rest under these names, and they shall be all very different, but let not our readers imagine a jot the less that they are the same, for whether they buy all like the one they show for Abercrombie, or all like the one they show for Sanzio, they may rest assured that they will possess in a season or two all the varieties. It is common enough to call one of them a name, according to the state in which it comes. If with very little colour, it is one thing, if with a good deal of colour, another thing, if it come flamed it is something else, and if feathered still something else, but half a dozen Abercrombie's or half-a-dozen Sanzios, which to indifferent people seem all alike, will come half a dozen ways the season or two after, and give all the varieties; nor, is it at all against our evidence, that for a season or two any one or other may appear to be constant. There will be some differences of opinion, and we know many who are growing flowers under the wrong name; but Mr. Pile is one of the most experienced growers we know, without exception, and we would rather stake his knowledge against the mistakes of others than hold any hope, that those who may see a thing apparently in contradiction have discovered any error in the above. Tulips rarely come twice alike, and this makes many a man fancy he has two sorts when he has but one.

## VARIETIES.

**FRUIT AND VEGETABLES.**—Vegetables were imported from the Netherlands in 1500, there being no kitchen gardens in England. Before this time sugar was eaten with meat to correct its prutescency.—Turnips and carrots are thought to be indigenous roots of France. Our cauliflowers came from Cyprus, our artichokes from Sicily, lettuce from Cos, a name vulgarly corrupted into Gos. Shallots or eschallots from Ascalon. What roving ideas on commerce and civilization may arise from a dinner and a dessert.—The cherry and filbert are from Cartana in Asia Minor; the peach and walnut from Persia; the plum from Syria; the pomegranate from Cyprus; the quince from Sidon; the olive and fig from Greece, as also the best apples and pears, though also found wild in France and even in this country; the apricot is from Armenia. The mountain wines come from the mountains around Malaga, Tent is tinto tinged, or red wine. Sherry from Xerxes, (the Spanish X is pronounced sh or ch), in the south of Spain, where the great battle fought between the Christians and Saracens, ended in the conquest of Spain by the latter. Malmsey was from Malvasia in the Peloponnesus, but afterwards propagated at Alicant, the Canaries, and Madeira.

**THE LAPACHO TREE.**—The lapacho is not only the finest but the most magnificent of all trees. English oak is very fine, but never to be compared to lapacho. From the solid trunk of one of these trees a Portuguese scooped out at Villa Real a canoe, which brought down to Assumption a hundred bales of yerba (that is, 22,500lbs. of Paraguay tea), several hides made up into balls and filled with molasses, a load of deals, seventy packages of tobacco, and eight Paraguay sailors to manage the three masts and sails of the large, but yet elegantly scooped-out trunk of the lapacho tree. Of this tree are constructed vessels which, when fifty years old, may still be called young. Their frame is not shaken, nor is their constitution debilitated by all the bumps they have on the sand-banks of the Parana, nor by the searching rays of a tropical sun, nor by the "even down pours," as the Scotch have it, of tropical rains.—*Robertson's Paraguay.*

**BOTANICAL NAMES.**—The naming of varieties of plants after some favourite person has become a complete pest to botany, and is destroying the very object of distinctions; as a proof of this, we would point out in even the periodicals of the present day, the false notions which it gives. Some botanist wants to compliment John Nokes, and he calls a new *Pimelia P. Nokesii*, or *Nokesiana*, or he has a supporter or a friend in Thomas Styles, and he calls

a new *Hovea H. Stylesii*, or *Stylesiana*. All this is very stupid, but that is not the worst. The first person who has to give an account of one of these so-called plants, — what is his interpretation? *Pimelia Nokesiana*, Mr. Nokes's *Pimelia*, or *Hovea Stylesiana*, Mr. Styles's *Hovea*, while neither of the plants are, in the most remote degree, connected with either the one or the other, and these two persons have the credit of raising, or introducing both. If a plant is to be named after a person, it should be the genus itself, thus *Nokesiana*, or *Stylesiana*, being the name of a genus, may be tolerated, because it can deceive nobody; it cannot be misinterpreted, every body will know, that if it be the name of a man it is a complimentary title, and they may say as much; it is of no consequence that the man after whom it was named earned the title by pandering to the pride of some botanist, into whose hands the subject first came for a name, but when it is made the foundation of a name to express a variety, or a specie, it absolutely misleads, because as the interpretation is invariably the same as if the person complimented was the raiser, or the importer, or the discoverer, it places both the plant and the person in false positions, for instance, Mr. Waterer called one of his fine varieties of Hybrid *Rhododendron*, *Glennyannum*, which being interpreted is the *Glenny's Rhododendron*, when Mr. Glenny had no more to do with it than the man in the moon.

**GRAFTING FANCY TREES AND SHRUBS.**—It is no uncommon thing to change pretty nearly all the varieties of fruit in an orchard, by merely grafting the new sorts upon old ones, and if this be desirable in fruit, how much more may be done in shrubberies and plantations? For instance, graft all the fancy thorns upon strong upright branches of the ordinary hedge, and there might be a collection of these beautifully ornamental trees at regular distances along the outer boundaries of a park, or garden, allowed to run up into standards; Hybrid *Rhododendrons* might be grafted on the large *Porticums*, *Azalias*, and *Magnolias* of the most novel kinds might be attached to their several stocks; the varieties of hardy *Cytissus* could be placed on the common *Laburnum*, the best varieties of *Ash*, *Oak*, *Horse-chesnut*, *Beech*, and other genera, could in one season be seen growing on the common sorts; for the most beautiful subjects might be made to grow on trees of their own species that are perfectly uninteresting; and a holly hedge might be made to produce standards of all the variegated kinds. This is worth the especial attention of those who wish to grow collections, and can obtain grafts for the purpose at the proper seasons.

**PUBLIC GARDEN AT FRANKFORT.**—Frankfort is surrounded, except on the side bounded by the Maine, with a pleasure ground at least two miles in length, and occupying the breadth of the former ditch and ramparts. It is laid out in the English style, and great variety of shady walks, and picturesque scenery, with the great advantage of being accessible from every part of the city in a few minutes. One peculiar feature of this pleasure ground is, that it is not confined to trees and shrubs, but contains a profusion of the choicest roses, georginas, chrysanthemums, &c., together with most of the showy annuals, and even pelargoniums, and *Tigridia Pavonia*, planted in large masses of each, intermixed with vast beds of *mignonette*, super clumps of *Brugmansia suaveolens*, *Salvia coccinea*, &c. Though merely separated from the high road by a low hedge, though at all times accessible (there being no doors or gates of any kind at the entrances), to every individual of a population of fifty thousand souls, and constantly frequented by servants and children of all descriptions, not a flower, nor a leaf of any of the plants, from the earliest and most showy, to the humblest, seems ever touched. Even the beds of *mignonette* look as untrodden and unplucked as in an English private garden. It is needless to say how utterly impossible it would be to have near any large English town a similar garden thus open to the public, and thus scrupulously kept from injury, and yet there are apparently no persons to guard it; and instead of threats of heavy penalties, a printed paper is affixed to a board at each entrance, expressing that the public authorities having originally formed, and annually keeping up the garden for the citizens, its trees, shrubs, and flowers are committed to the safeguard of their individual protection. This simple appeal is quite sufficient. This garden was planted and laid out by M. Sebastian Rison, nurserymen and garden-artist at Frankfort, and reflects on him the highest credit.

**FRANKINCENSE.**—Frankincense, which was also used in the worship of the true God, and on the altars of the heathen temples, was obtained from trees which grew in *Arabia Felix*. The incense trees grew only in that part of Arabia inhabited by the Sabæans, and so strict were their laws respecting them, that persons were not permitted even to see the trees, except those appointed to take care of them. The valley where they grew was surrounded by mountains, and was situated eight days' journey from Sabota (now Sanaa), the capital, whither the incense was conveyed on camels; and it was forbidden, on pain of death, to enter the city with this drug except at one particular gate, where the priests took a tenth part

for their god Sabis, and no person could either buy or sell it till this duty was discharged. The Gebanites were the only people allowed to carry it out of the country. They also paid a toll to their sovereign. It was taxed again at Gaza, and by the time the kings, the priests, the secretaries, the wardens of the temples, and the various officers had levied their contributions on this drug, but little was left to pay the great charge of bringing it to the coast. At the time the frankincense was taken to Alexandria to be tried, refined, and made up for sale, the workmen were attired only in short trowsers, which were sewed up and sealed, to prevent the possibility of their concealing any portion of this valuable drug. Their heads were fixed in a mask or caul, lest they should secrete the smallest portion in their mouths or ears. They were not suffered to depart after all these precautions without a strict examination.—*H. Phillips's History of Cultivated Vegetables.*

**WASPS.**—It is not generally known that the large wasps, which are seen flying about in the months of April and May, are *Queen* wasps, and that, therefore, the destruction of them is the prevention of the birth of myriads of wasps. These powerful enemies of the honey bees are eagerly sought after at this season by apiarians, by whom they are mercilessly destroyed. Earl Fitzwilliam gives a shilling for each wasp brought to him, "dead or alive," in the months of April and May; his lordship pays more than five or six pounds a year in this way, which he considers a very profitable expenditure as regards the protection of his fruit and honey bees.

**CELEBRATED OAKS.**—The oldest oak in England is supposed to be the Parliament oak (so called from the tradition of Edward the First holding a parliament under its branches), in Clipstone Park, belonging to the Duke of Portland; this park being also the most ancient in the island: it was a park before the conquest, and was seized as such by the Conqueror. The tree is supposed to be 1500 years old. The tallest oak in England was the property of the same nobleman: it was called the *Duke's walking-stick*; was higher than Westminster Abbey; and stood till of late years. The largest oak in England is the Calthorpe oak, Yorkshire; it measures seventy-eight feet in circumference where the trunk meets the ground. The *Three-Shire oak*, at Worksop, was so called from covering parts of the counties of York, Nottingham, and Derby. It had the greatest expanse of any recorded in this island, dropping over 777 square yards. The most productive oak was that of Gelonos in Monmouthshire, felled in 1810. Its bark brought £200, and its timber £670. In the

mansion of Tredegar Park, Monmouthshire, there is said to be a room forty-two feet long and twenty-seven feet broad, the floor and wainscot of which were the produce of a single oak-tree grown on the estate.

**ABSORPTION OF AZOTE BY PLANTS DURING VEGETATION.**—It appears that during the cultivation of trefoil in soil absolutely deprived of manure, and under the influence of air and water only, this plant acquires carbon, hydrogen, oxygen, and a quantity of azote, appreciable by analysis. Wheat cultivated exactly in the same circumstances also takes from the air and water carbon, hydrogen, and oxygen; but analysis does not prove that it has either lost or gained azote.—(*Annales de Chim. et de Phys.*)

**MOULDING POTATOES.**—A correspondent says—"I am not so addicted to old plans as to reject new ones where there is an evident improvement; but it appears to me that the suggestion usually put forth at this season of the year, that it is quite unnecessary to take the trouble of earthing up potatoes, is altogether untenable. The chief arguments against the practice are, that rain is thus prevented from percolating to the root, and that the bottom of the stalk is deprived of necessary moisture. Now, moulding would be unnecessary if the sets were planted very deeply; but we all know that they would not grow so well were this the case, and as it is, the potatoes would in some cases actually protrude through the ground, and many of them be discoloured and scorched up by the sun, if they were not earthed. There is undoubtedly an art in everything, even in moulding potatoes, and this should not be performed in such a manner as to prevent the moisture from reaching the roots, but a little space should be left between the tops of the ridges and the plants. Another advantage of earthing is, that the growth of this useful esculent is facilitated by loosening the ground.

**ORNAMENTAL SHRUBS.**—It is amusing and scarcely credible to see how very few ornamental shrubs and low trees were known to our ancestors. In the days of Queen Anne and of George I., almost the only ornamental trees and shrubs were variegated hollies, and a few of the commoner roses. What our ancestors wanted in the variety, and we may add quality, of their shrubs, was however made up in the great quantity of earth sort that was planted. High box, yew, or holly hedges, wildernesses of hornbeam, and bowers of roses, were the staple ornaments of their pleasure grounds, and a few lilacs and laburnums were introduced by those who wished it to be thought that they possessed a taste for botany. During the whole reign of Anne, according

to Loudon's "Arboretum Britannicum," not above half a dozen flowering shrubs were introduced; and in the reign of George I., not above nine or ten more. About the middle of the century, the American rhododendrons and kalmias began to be planted in English gardens; and from that period to the present time, the taste for, and consequently the importation of, foreign trees and shrubs have increased so rapidly, that between 1811 and 1830, above 700 new ornamental trees and shrubs were introduced into British pleasure-grounds.

**THE JASMINE.**—In the language of flowers, this beautiful plant signifies amiability. It grew in Hampton Court Gardens at the end of the seventeenth century; but being lost there, was known only in Europe in the garden of the Grand Duke of Tuscany, at Pisa. He strictly charged his gardener not to give a single sprig, or even a flower, to any person. The gardener might have been faithful if he had not loved; but being attached to a fair, though portionless damsel, he presented her with a bouquet on her birth day; and to render it more acceptable, ornamented it with a sprig of jasmine. The young maiden, to preserve the freshness of this pretty stranger, placed it in the earth, where it remained until the return of spring, when it budded forth and was covered with flowers. She had profited by her lover's lessons, and now cultivated her highly prized jasmine with care, for which she was amply repaid by its rapid growth. The poverty of the lovers had been a bar to their union; now, however, she amassed a little fortune by the sale of cuttings from the plant which love had given her, and bestowed it, with her hand, upon the gardener of her heart. The young girls of Tuscany, in remembrance of this adventure, always deck themselves on their wedding-day with a nosegay of jasmine.

**EFFECT OF CLIMATE UPON PLANTS.**—While climate points out the most suitable articles of food, it exercises a singular influence over their qualities and properties. We find plants which are poisonous in some countries, edible and wholesome in others. Next to climate, culture and soil modify plants in a singular degree. Flowers, which emit a powerful perfume in some latitudes, are inodorous in others; and, according to climate, their aroma is pleasant or distressing. A striking proof of this fact can be adduced from the well-known effects of perfumes in Rome; where the inhabitants, especially the females, cannot support the scent even of the rose, which has been known to produce syncope. This variety in the action of vegetable substances is more particularly observable in such as are considered medicinal.

Opium, narcotics, and various drugs, are more powerful in warm climates than in northern regions. The Italian physicians express astonishment at the comparatively large doses prescribed by our practitioners. All cruciform plants degenerate within the tropics, but acquire increased energies in cold countries.—*J. G. Millingen, M.D.*

**TRUNK OF TREES.**—In altitude, or length and diameter, the stems or trunks of trees present the most varied and contrasted features. According to Von Martins, there is a palm that grows full fifteen feet in height, with a trunk not thicker than the finger.—A comparison, indeed, between the stems of various plants would in some cases afford examples of widely divergent extremes. The *Scirpus capillaris* is not thicker than a hair, and some are as fine as a gossamer thread, while the trunk of the baobab is nearly 100 feet in circumference. Even canes and reeds in foreign climates sometimes rush up to an incredible altitude: Dr. Walsh cut down one of the canes in the Brazils, called with its congeners "grass of the thicket," and it was found to measure ninety feet in length; it was exquisitely polished and sharply pointed, and "felt lighter than a cart-whip." Amidst the dense gloom of the thicket, and struggling for existence, there is a reed which, though not thicker than a goose-quill, mounts upwards and overtops the loftiest trees of the forests of India. The "coque" of Chili threads the woods to an extent of 600 feet.—*Economy of Vegetation.*

**REASONS FOR PLANTING OAKS.**—When we consider the number of trees that are required to build a single ship, and the length of time necessary to bring them to maturity, it becomes the duty of every landed proprietor to plant for the sake of posterity. "Any oak in a good soil and situation," says South, a practical planter, "will, in seventy-five years from the acorn, contain a ton of timber, or a load and a half of square timber." By the report of the Commissioners of Land Revenue, respecting timber, printed by order of the House of Commons, it appears that a 74-gun ship contains about 2000 tons, which, at the rate of a load and a half to the ton, would give 3000 loads of timber; and would consequently require 2000 trees of seventy-five years' growth, or 250 of one hundred and fifty years' growth. It has also been calculated that, as not more than forty oaks, containing a load and a half of timber in each, can stand upon an acre, fifty acres are required to produce the oaks necessary for every 74-gun-ship.

**DECREASE OF FORESTS IN AMERICA.**—That the barren grounds were formerly far less bare of wood than they are at present, we had proofs in the dead stumps that were met with beyond

the living trees; fully confirming the accounts of the Indians, that large tracts of country now naked were once covered with thick forests. This decrease of woods in certain meridians has not yet been accounted for; although the same phenomenon exists in the more northern parts of the European continent. In Iceland, where wood was formerly abundant, scarcely any remains; and the same may be remarked of the Orkney, Shetland, and Western islands. The natives of North America cannot assign any cause for this change.—*King's Journey to the Shores of the Arctic Ocean.*

**WATER-CRESS.**—The grateful and salutary qualities of this vegetable are too well known to need description; but at certain periods of the year, when perhaps the cress is in its best state for the table, it is common for the under part of the leaves to have a white gelatinous substance adhering to them, which cannot be removed by washing; and small snails are also fixed on them. It may be useful to many to learn, that if the cresses are put into a strong brine, made with common salt and water, and suffered to remain there ten minutes or less, everything of the animal or insect kind will be detached from the leaves, and the cresses can afterwards be washed in pure water and sent to table. Small salads, cabbages, cauliflower, brocoli, celery, lettuces, and vegetables of all descriptions, by the same simple method, may be freed from slugs, worms, or insects. If a jar of brine is kept for the purpose, and strained after being used, it will last many weeks, and the expense, of course, be trifling.

**THE ORANGE.**—Camoens is said to have introduced the Orange into Portugal. "Yes!" said Camoens, apostrophising the fragrant little grove that waved before the open casement, "I have made a bower for the honey-bee, hung with golden lamps;" the wayfarer may laugh at the poet's fancy, as though I had woven a chaplet of flowers that must wither and die;—but a time shall come when the thirsty traveller shall drink of the fountains of that tree throughout the land—ships shall freight themselves from its branches, and the maiden hear the song of Camoens beneath its boughs—breathed by a lover's voice—as, culling the fragrant blossoms, he binds them on her brow, and wins her for his bride."—*John's Legend and Romance.*

**VENERABLE GIANTS.**—In the gardens of Chapultepec, near Mexico (says a modern traveller), is a magnificent cypress, called the cypress of Montezuma. It had attained its full growth when that monarch was on the throne in 1520; yet it retains all the vigour of youthful vegetation; the trunk is forty-one feet in circumference. At Santa Maria de

Tula, in Oaxaca, there is a cypress, the trunk of which is ninety-three feet in circumference, and yet does not show the slightest symptom of decay.

**MAGNOLIA GRANDIFLORA.**—This fine tree appears to have been first brought to Europe, from the banks of the Mississippi, in 1732, by a French officer of marines, who planted it at his native place, Maillardiére, about four miles from Nantes. Here the *Magnolia* grew and flourished; but, its introducer having died, little notice was taken of it; and, when observed, it was only supposed to be some variety of the common *laurel*, which it resembled in its leaves. Thirty years afterwards it flowered, and was then discovered by M. Bonami, professor of botany at Nantes, to be the *Magnolia Grandiflora* of Linnæus. At a meeting of the States ta Bretagne, held at Nantes in 1760, M. Bonami presented a branch of this *Magnolia* in flower to the Princess de Rohan Chabot, and it excited so much admiration that its fame shortly after reached the ears of Louis the Fifteenth. The monarch was then ornamenting his garden at the Petit Trianon, and had there some small plants of the *Magnolia Grandiflora*, which had, in the meantime, been re-introduced into Europe by one of the English collectors; and when Louis heard that he had in his own dominions a tree of this rare exotic, forty feet in height, which was covered with blossoms every year, he sent two of his gardeners to examine it, with orders to transport it to Versailles, if they could ensure its living. This *if* was a formidable obstacle; and the gardeners reporting that they feared it would not survive its removal, it was suffered to remain at Maillardiére. Thirty years more brought the Revolution, and amidst the general destruction the poor *Magnolia* did not escape; it was mutilated in the war of La Vendée, and its branches were cut for fire-wood.

#### OBSERVATIONS ON LANDSCAPE GARDENING.

Few works have been more looked up for instruction on Landscape Gardening than the *Gardener and Practical Florist*, and we have endeavoured, independently of the papers written expressly for the work by known authors, to give from time to time the remarks of persons practically acquainted with the subject, but written for very different undertakings. Of all the travellers in this country, perhaps there was hardly a more correct observer, nor a more pains-taking author than Prince Pückler. His work on Landscape Gardening is not without its faults, but it has great merit, notwithstanding; the following is a free translation, somewhat abridged, but per-

fectly intelligible, and it should be read, as indeed all works on landscape gardening, by every one who desires to excel in his profession, as well as all those who contemplate making improvements. It will be seen that almost all have different notions, and it is almost impossible to read even those who differ from each other without profiting from some part of each.

"The praise I bestow on England does not proceed from Anglomania, but from the certain conviction that England is far superior to any other part of the world, in respect to desirable and (if I may be allowed the expression) gentlemanly enjoyments, particularly in reference to a country life. In England we continually find general comforts united with noble occupations; and a style of living equally far removed from Asiatic revelry, as from that sparing continental economy which has its foundation, not in actual poverty, but in bad customs and neglected household arrangements, and is but too common among us. In this respect, then, we must look up to England as a model.

"From this high state of civilization, landscape-gardening has been more extensively encouraged in England, than it ever was known to be at any other period, or in any other country; and, notwithstanding its cloudy skies, England has produced the greatest numbers of the most delightful abodes for the lovers of nature, and for those who prefer what is effected by the united aid of nature and art. Such places may, indeed, be compared to the diamond, not in its rough state, but which has obtained the height of its beauty from the hand of the polisher. I do not mean to assert that nature in its wildest state and greatest simplicity cannot produce ample excitement, and call forth the most sublime feelings; yet, in order to preserve nature in this state, traces of the judicious hand of man are necessary. Even in the painted landscape we seem to wish to behold traces of the hand of man to enliven it; and this is still much more unnecessary in the real landscape, which would appear doubly agreeable to us, if we acted as they do in England, where, from a manly and generous feeling, their rural improvements extend not only to their palaces and gardens, which excite our admiration by their splendour and beauty, but to the humble dwellings of the smallest farmers and even cottagers, which are equally well laid out and agreeably situated, and which thus aid in forming harmony of the whole. In England small farm houses are to be seen, like proud palaces, surrounded by ancient trees, or by luxuriant meadows, ornamented by flowering shrubs; and they manifest the taste and good

sense of the owner by the appearance they display. Even the poorest man ornaments his thatched cottage with flowers; and, notwithstanding his poverty, cultivates with care a well-hedged small garden, where there is nothing but the green velvet grass perfumed by roses and jasmine.

"Are we not overpowered with shame when we take the same view of our country? We here find a great number of noblemen's seats with a dunghill in front, and pigs and geese going in and out at the door during the greater part of the day, while the only mark of cleanliness the interior can boast, is that the floor is strewn with sand. Independent people, indeed even those who are very rich, I have often seen, in the north of Germany, living in such pseudo palaces, as such houses may be called, as an English farmer would undoubtedly take for the stable.

"Such is a nobleman's seat in the north of Germany. The kitchen-garden is generally near the house; and its greatest ornaments are a few plants of sweetwilliam and lavender round the beds of onions and cabbages; crooked-grown fruit-trees look melancholy round the beds of carrots and turnips; and a very few old oaks or limes, that have stood many a blast, are clothed with dry and scanty foliage, and look like naked victims, their bare branches appearing to be stretched out to heaven, imploring vengeance on the masters that have so cruelly neglected them.

"In the more cultivated parts of Germany this is not the case. The farm-yard and kitchen-garden are always behind the house, while in front there is a lawn with flowers and plantations.

"It is as much to be lamented when the proprietor lays out his place in what is called, with us, the English style. The straight walks are then so formally made serpentine, that the only difference between the two styles is, a longer road is made between the two rows of young birches, poplars, and larches, which, in wet weather, is almost impassable for dirt, and, in dry weather, from the depth of the loose sand. Some foreign trees, badly grown, and therefore not so beautiful as the indigenous ones, mixed with pines, are planted by the sides of the paths; but, in the course of a few years, the pines grow over the path, and must be pruned; afterwards the under branches drop off, and then the stems are left naked; while, below, the badly-grown grass and stunted foreign trees neither present a natural picture, nor one which the art of the landscape gardener should produce. Where the subject is more earnestly and more extensively pursued, unsightly stagnant water is turned into running brooks; and a bridge,

made of the rough stems of the birch, with suitable arches, is thrown across the gentle stream. A few vistas are cut through the forest to produce beautiful views; and here and there a temple and a ruin are erected, though the former usually too soon becomes what the latter is intended to represent.

"This is, generally speaking, the highest point of perfection ever reached in such an undertaking; and it is one which, indeed, only causes us to regret that such good land is not cultivated for a more useful purpose.

"English gardens in Germany are, however, often laughed at, with more or less reason; and, where they are attempted, there are seldom any other improvements made. Therefore, I repeat, that when large and extensive gardens are laid out by us with the greatest care, they only bear testimony that the art of landscape-gardening in Germany has not at present advanced one step. There are, indeed, some exceptions, but they are but very few; and I know of none which, like the English gardens, I could hold up as a model. We must hope, however, that the Royal grounds, under the direction of the very estimable Lené, who, it is said, will surround all Potsdam with an extensive park, will one day present such a model as I allude to.

"Far be it from my intention to presume to teach any thing quite new on the subject; but a tolerably long practical experience, a careful examination of excellent prototypes, united with a passionate love for the subject, and a study of the best works on the art of gardening (taken in its most extensive signification), enables me, as I think, to offer a few useful hints; indeed, even a few simple rules, which may not be altogether unworthy of the notice of even professional men, and which will be an acquisition to *dilletanti* in nature-painting, if I may thus term the production of a picture, which consists not merely of colours, but of real forests, hills, meadows, and rivers. These hints and rules, when well understood and properly applied, will enable amateurs to impart their own ideas to their garden-director, engineer, inspector, or gardener, or whatever the person may be called to whom they entrust the execution of their plans. These amateurs, without paying too dearly for their experience, may be enabled to create a work of art, originating entirely from their own minds, instead of employing a person to lay out a garden or grounds, in the same way, and with as little mental excitement, as they would send for a tailor to make a suit of clothes.

#### SECTION I.—*Fundamental Idea and Plan of a Pleasure Ground.*

"In my opinion landscape gardening, when

on a large scale, should be directed by a fundamental idea. I must be allowed here to use the word idea, as is customary in common conversation, and not according to the new system of philosophy. In landscape gardening, the word idea is generally used in its most extensive meaning, viz., that from the whole of nature's landscape, the idea of a concentrated picture is formed; a picture such as that which a poet fancies; that this idea is such as would give existence to a work of art in another sphere, and from which man himself frames a kind of microcosm, a world in miniature. A large undertaking should, consequently, as much possible, be begun, directed, and finished by one experienced hand. The ideas of another, it is true, might be used; but they must be so acted upon that they may combine in forming a whole. I shall, perhaps, be better understood when I say that which I mean by a fundamental idea, is a plan or system which refers to the whole; that no important work should ever be begun at random, but should proceed from one leading principle, which should be observable in every part of it, whether taken separately or together. This original idea, or plan, may arise from the particular condition of the artist, from the circumstances of his life, or from family legends, as well as from the particular locality in which he lives, but I by no means wish that every part of the plan, as originally conceived, should always be adhered to, and strictly followed up. In certain circumstances, I should recommend quite the contrary; because, although the whole thing may be arranged, the artist is not obliged to follow the first dictates of his fancy. New thoughts may spring up, for the subject is ever creating something new; for instance, nature in its primitive state, lying before him in various degrees of light (because, as a beautiful comparison, light may be called his principal material), is observed by him in the circle of his small creation; he studies cause and effect; and then the original general idea directs the manner in which they may be combined, or is entirely given up if a better thought strikes him. The painter, also occasionally deviates from his first plan, and continually touches up his picture without ever making it perfect; parts are altered to make it look better, or more natural; a shadow is strengthened, or more effect is given to a line. How, then, can a landscape gardener be expected to make a thing perfect at first, who has often such perverse and difficult materials to work upon?

"I know nothing so much to be lamented as when a thing has been badly done, and not undone, if afterwards a better idea has arisen: it remains a blemish to the whole; and though it may occasion regret that the cost of form-



ing it should be quite thrown away, the fear of wasting a trifle should not be suffered to destroy the effect of the whole. Indulgence should be granted to the progress of every art, because frequently, from want of money, the improvement of the old is preferred to a totally new arrangement. It is also dangerous to delay making an improvement that is considered necessary, because the presence of the bad is apt to mislead in the execution of the new, and something unsightly is thereby produced.

"Some one says, very justly, that a production of art is an affair of honour, and also an affair of conscience. Therefore it is not possible that he who truly understands the art, can be satisfied with what he is aware does not accord, or imperfectly harmonises with the whole. He rather makes every sacrifice than allow the polluting speck to stand, were it only for a subordinate object: as nature always establishes and finishes the smallest of the wonderful works of her creation, with as much love and care, as she tends the greatest and most exalted objects.

"Although in my grounds in Muskau, I never for a moment lost sight of the fundamental idea (which at a future time I shall find a more convenient opportunity of explaining), yet I will not deny that there are many scenes in it, which have been not only altered slightly, but often once, thrice, and even four times have entirely undergone a total change.

"Those are very much mistaken who believe that confusion ensues from those frequent alterations; but they should be made with reason and judgment, and not merely from caprice; and great care should certainly be taken that a mere alteration may not be mistaken for an improvement. The principal of *nonum pre-matur in annum* may therefore be applied here; and we should never rest satisfied with correcting and improving, till we have at last obtained the highest perfection of which the case is susceptible. Unfortunately, this degree of perfection can frequently be only ascertained by time; and this tedious waiting is peculiar to the landscape gardener, as other artists, by their unlimited controul over their materials, are happily exempted from having to observe and calculate their effects.

"A few years ago, while conducting a well-informed lady over my grounds, she said very modestly, that it was true she understood but little of the subject, but that, though she had seen many places more picturesque and grand than this one, she felt here a continual pleasing sensation, a sense of undisturbed repose in the whole. No praise was ever so flattering to me, and if it is well founded, I may consider that I have succeeded in my undertaking.

I owe this principally to the two fundamental principles I have just stated: viz., that of only following one leading idea, and that of never allowing any thing to remain which was discovered to be individually defective. It may, therefore, easily be seen how useless it must be to employ a draughtsman from a distance to make a plan of a road or plantation which it is wished to alter; though nothing is more common than for a landscape gardener to set about making a plan for laying out grounds, without obtaining the necessary information, without any knowledge of the locality of the near and distant views, or of the effect of hill and dale, and of high trees and low ones, in the intermediate distance, and also at the greatest distance. Plans thus designed may look exceedingly well on paper; but, when they are executed they generally produce an effect that is extremely pitiable, flat, unsuitable, unnatural, and unexpected. Whoever wishes to make a proper plan for laying out grounds, cannot be too well acquainted with the locality; and he must also understand the staking out, and the execution of his plans extremely well; because, if he does not, he will find that the materials he has to work with are quite different from those of the painter on the canvass.

"The beauty of a real landscape may in some degree be known, by looking at a very good painting; but it is not so with a plan, and I can confidently assert, that (except in a very flat situation, where there are no distant prospects, and which, therefore, is a place that nothing can be made of) a plan which looks exceedingly well on paper can never produce any thing fine in nature when executed; and, on the contrary, that in order to produce anything worthy of admiration in execution, a union of forms must be made, which would appear on paper quite inconsistent.

## SECTION II.—Size and Extension.

"It is not necessary that a park should be of great extent, in order to produce a great effect. Grounds that are almost interminable, are frequently so diminished and bungled in appearance, that they become quite inconsiderable, and *vice versa*; in my opinion, therefore, Michael Angelo said very unjustly of the Pantheon; "It is admired on the ground, I will place it in the air," by that means hoping to obtain a greater effect. He actually did so, by giving the dome of St. Peter's the same proportion as the Pantheon; but how unsuccessful the result! The dome, as seen above, among the enormous masses of the building, looks proportionally small and insignificant, while that of the Pantheon, placed in a proper situation, has for a thousand years appeared

sublime, like the arch of the firmament. The pyramids placed on the top of Mount Blanc would scarcely appear as large as sentry-boxes; and Mount Blanc itself, when seen from the distant plains appear only like a small hill of snow. Large and small, therefore, are always relative. We judge of every object, not as it is, but as it appears to be; and in this respect there is a wide field opened to the landscape gardener. The tree, for example, in the middle ground of the landscape a hundred feet high, which does not cover the horizon, would do so only a few steps from us, if only about ten feet high; and therefore, by skilful treatment of the foreground, striking effects can be most speedily and easily produced, and expressive features given to the landscape.

"I cannot help observing in this place, that although I have given the general appearance of the English scenery, and their universally extensive taste for culture and landscape improvement as a pattern, I am still of opinion that, in the execution of the detail, much better might be effected. It appears to me that the beauty of most of the English parks is lessened by attempting to make too much of them; that is, making them appear as large as possible; and that they thus sooner become more tiresome and monotonous than anything that ever came under my observation in such a beautifully cultivated and open landscape scenery.\* Many of the English parks are, in fact, nothing but very extensive meadows, sprinkled with picturesque groups of high and low trees. Partly to enliven the landscape, and partly for use, the English generally have in their parks some tame animals, such as sheep and black cattle, or horses. The first sight of such an extensive space is imposing, and almost always presents a splendid picture; but the impression, once received, is incapable of improvement, and soon becomes monotonous. If you then examine the scene more closely, many faults will be found. All the branches of the trees are eaten off to a certain height by cattle, and often in as regular a manner as if they had been cut by hedge-shears; and the forms of the trees have consequently very little variety. The groups should certainly have some kind of fence; indeed, every newly planted single tree requires the same thing, which produces a stiff and very formal appearance. In general, cattle prevent the use of shrubs, which are so desirable for breaking the views, and producing several smaller views or scenes out of the principal landscape. Only one road leads

through this extensive desert, to and from the house, which, without any trace of the hand of man, is situated on a lawn in bare and cold majesty; the cows and sheep feeding close to the flight of marble steps which lead to the entrance door. It is not astonishing if, in such a monotonous and extensive place, an involuntary shudder should be felt; and it is a place where none but a John Bull would live. The scene would be much improved if a particular place were allotted for the cattle and deer, instead of giving them the range of the whole park. It, however, seems a rooted idea in England that a landscape cannot be lively without cattle; though if enlivened by man they consider it quite insupportable, and the gardens of a private gentleman in England are generally hermetically sealed to every stranger. They are quite unacquainted with the kindness of our nobility, and give as an excuse for their liberality, the excessive rudeness of the common people.

"Although I have already established the principle that a large extent of territory is not necessary for a park, I confess that where extent can be obtained without too great a sacrifice, it is very desirable, so as to be able to unite with imposing greatness the universally prevailing charm for variety. All other things being the same, I would, therefore, always give the preference to an extensive park rather than to a small one, even if the latter were more favoured by natural beauties. As territory and soil are of much less value in Germany than in many other places, such an extent is much easier obtained here than in England, and I would the experiment to be tried as much as possible; and when the estate is not large, I would advise the whole to be left without any apparent divisions, so as to convert the whole into a highly improved landscape. Such a change, though it may appear at first sight to be encroaching too much on rural economy, is often easier effected, and with less cost, than is generally supposed.

"It is certain that a park, considered as a whole, in which we cannot walk or ride for an hour at a quick pace, without passing over the same ground, and which does not also contain a great number of other paths, very soon wears when we are confined to it alone; whereas, on the contrary, when an abundance of picturesque natural scenery abounds in the neighbourhood, it presents itself, like a work of art, which, instead of being confined to visible limits, is only circumscribed by the horizon, such as may be found in great part of Switzerland, Italy, the south of Germany, and part of our Silesia. In such a country, I am of opinion, that all pleasure grounds of an extended description are but mere *hors d'œuvre*; and they appear to me

\* I do not mean to include in this censure either the English pleasure gardens which are full of variety, but only the English parks.

as if a separate small landscape were attempted to be painted in the corner of a splendid Claude Lorraine. In such a natural scene, let us be contented merely with forming convenient roads, so as to render the enjoyment more complete; and here and there removing a few trees to admit a distant prospect, which nature, profuse in displaying her beauties, may have covered with too thick a veil. Let us be satisfied with a small but delightful garden round the house, as much as possible in contrast with the surrounding scenery, and in which narrow space the multiplied variety of a landscape is not the object in view, but convenience, agreeableness, security, and elegance. The art of gardening among the ancients, which was introduced during the 15th century, from the descriptions given of it by classical writers, and particularly from the accounts Pliny has left us of his villas, and from which, at a more recent period, the French art of gardening had its origin, though in a colder and less agreeable form, requires here particular consideration. This rich and splendid art, which may be called a transmission of the architecture of the house to the garden, as the English or natural style may be called, bringing the land-

scape to the very doors—might be most applicable to the purpose in question. Fancy, for instance, among the rocks in Switzerland, surrounded by abysses and waterfalls, dark pine and fir forests, and blue glaciers, an antique building, or a palace from the street *Balbi*, ornamented with all the splendour and taste of architecture, surrounded by high terraces, rich pastures, many-coloured flowers, and enlivened by shady bowers of roses and vines, well-executed statues, and gushing fountains—the whole extent of the natural splendour of the mountains extending wide around this garden. Take but a step sideways in the forest, and the palace and garden disappear, as if by enchantment, to give place to the undisturbed solitude and wildness of exalted nature; and then, perhaps, a turn in the path unexpectedly introduces a distant view, where, at a greater distance, the work of art again appears through an opening in the gloomy firs, glowing in all the warm luxuriance of an evening sun, or rearing itself above the misty valley in the splendour of its reflected light, absolutely like a fairy dream. Would not such a picture be most delightful, and would it not be indebted for its greatest beauties to contrast?



### THE GARDENER'S SKETCH BOOK.—NO. III.

THERE is little to be said upon the subject of this sketch, for there is neither note nor comment further than that it is a grotto and rock-work, formed of the common clinkers from a brickfield, that is to say, bricks that have been over burned and vitrified, or so run together as to be spoiled for the ordinary uses of bricks; one of the best materials for rock-work short of actual rock, because they run together in lumps of a dozen bricks, and in all sorts of forms, and are sold by the ton in almost every

brickfield, for unfortunately they all occasionally spoil a kiln of bricks, and have to throw them by for the purpose. Some excellent examples of rock-work formed of this material may be seen in the Royal Botanical Gardens, Regent's Park, but a mere heap thrown together can hardly fail to make a good rock on which to grow the plants which flourish in such situations; as, however, there should be soil to fill up all the interstices, it is better to lay a quantity of mould or rubbish

in a heap, and place only one layer of the material on it with the best face outwards; soil may then be placed to fill up where they join, and in these joins the alpine and other rock plants are placed. Of course there is more art required in building any kind of grotto, and they must be put together with proper mortar or cement, and of this description of erection the sketch above is a specimen. These clinkers are excellent things to put or pile up all natural banks, and where there is any ugly object to hide, an artificial bank may be made and covered in the same way.

### THE CARNATION.

BY MR. JAMES WOOD, NURSERYMAN, COPPICE, NEAR NOTTINGHAM.

WITHOUT wishing at all to depreciate other varieties of what are termed florists' flowers, and of which I sincerely wish there were more cultivators, and though I may have rather a prejudice in favour of the Tulip, yet it must be allowed that the subject of this essay, "The Carnation," is a universal favourite, and from its more speedy increase, by means of seeds, pipings, and layers, it may truly be designated every body's flower; and, in fact, rich and poor seem to agree in this, whatever else they may differ in, that the Carnation is worthy of their greatest care, and draws from both unequivocal expressions and feelings of delight.

There have been so many treatises written on its cultivation, and rules laid down for propagation and management, that, in attempting to describe a system, I fear I may run some danger of being suspected of plagiarism; or perhaps, after having endeavoured to enlighten my friends round about me, I may after all find that they even can tell me what I am unacquainted with; at all events, I do not mean to assume to myself any extraordinary ability, neither do I suppose that I shall be considered an oracle; but as our object is mutual instruction, perhaps the few observations brought forward this evening may elucidate fresh facts, or lead to other ways or systems of management which shall be more congenial to the habits of this favourite and fragrant flower.

The generic name of the Carnation is *Dianthus*, derived from the two Greek words—*Dios*, divine, and *anthos*, a flower, alluding to the delightful scent as well as the beauty of its blossoms. A near relative is the common garden Pink, which has been so much improved of late years. The Sweet William, too, belongs to the same family; and many others, of which we need not at this time take any further notice.

I have just told you that the generic or fa-

mily name of the Carnation is *Dianthus*; its specific name or title, by which it is distinguished from other members of its tribe, is *Caryophyllus*, *Flore-pleno*, or the Double-flowing Carnation.

By the scientific name it is usually called by botanists, but florists in general content themselves with the English name, and by that is generally known.

This flower is divided into several classes, and of late years these have been increased, indicated by the colour of the flowers. There are now shown at different exhibitions in the country—Scarlet Bizarres; each petal being striped with two colours, scarlet and a dark maroon, on a white ground, varying in intensity in different sorts.

Crimson Bizarres; the stripes also consisting of two colours, but approaching in their tint more to a rose-colour and purple. In this class there is a subdivision, styled pink and purple, which are lighter and more lively in their shades.

There are yet three other classes, consisting of Flakes. Their colours are scarlet, rose, or pink, and purple of various hues; some being many shades darker than others in each of the divisions.

After the Flakes come the varieties called Piccotees, or Carnations, with either spotted or striped margins to their petals. Of these there is a very great variety, and they may be classed under the heads of scarlet, red, rose-coloured, and purple. Formerly they were only shown in two classes—red and purple—without any reference to the extent of the colouring; but now each class is subdivided into heavy-edged, with the colour thickly laid on round the margin of the leaf, and are called in Lancashire striped Piccotees; and feathered, or light-edged, where the colour touches the leaf in an unbroken delicate line.

Whether the air or soil of Nottinghamshire, Derbyshire, Yorkshire, Lancashire, and Leicestershire, is peculiarly favourable, or whether fortune smiles more on the weavers and cottagers of these districts,—one thing is certain, that immense quantities are raised, and good and beautiful flowers have lately been introduced into the fancy; and it is no uncommon thing for a florist to raise from two to ten good seedlings in a year, fit to take a place in any stand, and which will beat the old varieties into the bargain. The great desiderata in all flowers, whether Carnations or Piccotees (of course excluding the yellow), is the unsullied purity of the body colour (if it may so be termed): this should be a pure white, let the class be what it may; for should it be spotted or tinged, however imposing the grandeur of the other colours may be, it is

allowed to be a very serious drawback indeed. In bizzarres the colours should as much as possible balance, though I am well aware that there is often a great preponderance of one or the other; still to see the stripes running parallel to each other, and distributed equally over the flower, is certainly a near approach to perfection, as far as colour goes.

In flakes the same proportions are desirable, though some have too much colour, as I am inclined to think is the case sometimes with Addenbrook's Lydia, scarlet flake, whilst the reverse is the case with Hogg's Paddington Beauty, in the Rose class, at least if we have it correct in this neighbourhood.

As for Picotees, a clearness and decision of marking is requisite, and the fringed or notched petal is now considered a deformity. A smooth edge, or, as it is usually termed, a rose leaf with the colour bright and distinct, is required by all connoisseurs of this delicate and much admired class.

I now propose to lay before you my ideas, and offer a few observations on the culture of the Carnation. You must, if you please, still bear in mind, that I am very far from asserting that my system is the best; yet I am sure that, if followed, healthy layers and fine flowers will be produced.

In looking over the various horticultural memoranda I make during the year, I find it will be best to begin at the period when the layers are taken off, as that is the time of all others that I would recommend those wishing to commence Carnation growing, to lay in their stock.

We will then suppose that the layers are sufficiently rooted. Having removed the pegs which confined them in the ground, they must be carefully lifted up, for it sometimes happens that the weight of the soil attached to the root causes it suddenly to break off, to the great disappointment of the grower; they must then be separated from the parent plant, and the stem cut back at a joint as near as possible to the root; this should be particularly observed, as the layer will very often strike again at the section. A few of the bottom leaves may be shortened, though I am no advocate for the unmerciful trimming which some people give their layers, as I imagine that the removal of leaves at this stage of their growth has a prejudicial effect on the root. Having removed the layers, they may be potted a pair together in pint pots. Some florists in their prescriptions (for florists give prescriptions as well as doctors,) recommend manure to be mixed with the soil for potting at this season. But as doctors differ, I must also beg leave to give my veto against this practice. The mixture I winter mine in is one-half road scrapings, one-

fourth willow-dust, and one-fourth turfy loam, broken and mixed up with the spade, but on no account riddled. This is not too forcing, but will keep the layers in good health; it being a great point in their after management, not to have them of too gross a habit during winter, which the presence of manure in the soil would have a tendency to promote. The drainage of the pots must also be well attended to, and putting a small piece of moss over the pot-sherds, will prevent the soil from mixing with them and clogging up the drainage. The pots containing the layers must be very slightly watered (but not over the foliage), and should then be placed in a cold frame for a few days, and the lights closed and shaded, so that they may strike fresh root, after which they must be gradually exposed and inured to the open air, and when convenient removed to any suitable sheltered spot, taking care that a thick layer of coal-ashes, or boards, are under the pots, to prevent the ingress of worms.

As Carnations are by no means partial at this season to much wet, many florists erect a temporary covering with the lights belonging to their frames, and this answers the purpose very well. But the same gentleman who I have before alluded to, built a sort of greenhouse, open at the sides and front, under which he had a stage near the glass, on which the pots were placed; in rough windy weather, in sleet or snow, or when apprehensive of a severe frost, he made a good protection of mats; but on all other occasions they had all the weather; the result was, that his layers were healthy, the produce great, and flowers fine. I also recollect seeing lately an account of some layers in France, which had been potted in strong soil, and placed in a north aspect; they were seldom watered, and were protected from rain. They escaped in the severe winter of 1837 and 38, whilst most other collections which had been more tenderly nursed were destroyed. I may here observe, that from being placed in a north aspect, and having but a small quantity of moisture, the innumerable small cells or vessels contained in the stem of the layer were undoubtedly not overcharged with sap, as is the case with plants of a gross and robust habit, and would escape the effects of severe weather; whilst on the other hand, those whose sap-vessels are fully distended would experience ruinous effects from the frozen sap becoming too large for their vessels or cells, and a complete rupture takes place throughout the plant, causing its dissolution. As a familiar illustration, the same effects may be observed in our own gardens; for in severe frosts, when a flowerpot is filled with wet soil, and the mass becomes frozen through, the destruction of the pot is the consequence. From this it will be

seen that it is imperatively necessary that they should be kept nearly dry through the winter months. My own plan, immediately after removing the layers from the closed frame before alluded to, was to place them under a slight awning, made of thin calico, stretched on a frame about twelve feet long, by three feet broad, and painted with oil and a little white lead; this is attached to a wall, so that I can let it up or down at pleasure. They remain beneath this, alike sheltered from too much sun, which is injurious at their first removal, as well as the heavy dashing autumn rains, till the approach of frost gives a hint that some further protection is necessary.

For my own part, I think that many layers are annually lost by over kindness; being made more susceptible of cold by the nursing and stewing they get in frames; and where Mr. Bucknall's plan can be followed, for wintering them under a glass roof with open sides, I most certainly would recommend it.

But for those who either cannot or will not be at the expense of such an erection, the old system of protection must suffice. They must, therefore, choose a north aspect for their frames, and put a thick layer of coal-ashes on the bottom; on which rows of bricks are laid, sufficiently far apart, that the pots may stand just touching each other: the frame must be tilted at bottom, so as to admit a free current of air, which it is desirable to obtain as long as possible. Brick pits or frames, which are decidedly preferable, should have square apertures, both before and behind; with a sliding panel or door, as in rainy weather, when the lights are down, a circulation could not be obtained, and on this I would lay great stress; for being kept too close engenders mildew, and too often ruins a whole stock. I have tried the plan, and found it answer, of plunging my pots in barley chaff: this keeps the roots from too great extremes, occasioned by the action of the air on the pots; it is also an excellent preventive against frost, and completely sets the inroads of snails and worms at defiance. The only objection to its use was, that sparrows would get into the frame, and in their search for corn scatter the awns over the tops of the pots, and they lodged between the leaves; but this I easily obviated by adopting Mr. Anderson's plan of stretching black thread just under the lights, which completely rid me of these troublesome visitants.

While in their winter quarters attention must be paid to take off the lights on every opportunity, and draw them over again on the appearance of rain. In fact, it must be borne in mind that abundance of air, without unnecessary exposure to cutting winds, is essentially requisite for the health of the layers.

During the time they are in the frames, the soils or compost, in which they are to be flowered, should be well looked after. The heaps should be often turned, and especially in frosty weather, when a vigilant look-out must be kept for the brandling or wire-worm.

The compost I would recommend is two barrowful of good rotten turf, well broken with the spade; two barrowful of very rotten horse-manure, from a melon or cucumber bed; one barrowful of either rotten leaves, sticks, or thatch, and one barrowful of wash-sand from a road side.

All this should be well mixed and repeatedly turned, so that the incorporation may be complete. The turf ought, every bit of it, to go through the hand, and the lumps pulled to pieces to detect the hidden foe; and though only one brandling may be found, still you may consider yourself amply repaid for your trouble. The soil having been well turned, about a fortnight before the time of planting the layers out, which is generally about the latter end of March, sometimes sooner or later, according to the season, I put plenty of drainage in the pots and fill them to the rim with the compost, which will then subside before I plant; and, in order that the soil may be perfectly clear, or to make assurance doubly sure, I insert pieces of carrot and slices of potatoes, to entrap any grubs or insects which may have before escaped. But a more certain way than this has lately been adopted by an old friend of mine; he puts about two pecks of soil at a time into his side-oven, and, after subjecting it to a heat destructive to vitality, whether in the shape of worms or eggs, he removes it, and subjects another parcel to the same process, till he has sufficient for his use; and, in this part of the country, where side-ovens constitute the principal feature in the cottager's fire-grate, and where, of course, there is a constant and abundant heat, a great deal can be effectually cleaned with no other expense than the trouble. All this may to some growers appear needless, and a trouble which the difference will not repay; but it is punctuality and care in small matters, attending to the minutiae of the thing, which very often enables the grower of fifty pairs to beat the careless cultivator of 500, and at the same time prevents the loss and mortification of seeing layer after layer of some favourite sort to go in rapid succession. If this then can be prevented, I think it will be acknowledged that no trouble is too great that will accomplish it.

I now come to the planting of the layers out in the pots, supposing that the soil is cleared of destructive insects. They should be set a pair in each, and the pots ought not to be less than half-pecks. A hornbeam, or other hedge, having

a south or south-east exposure will be found most suitable for them. A wall ought to be as much as possible avoided; such a situation will be found extremely prejudicial, being so liable to drafts and eddies. After having been planted a short time, the sticks may be inserted in the pots, for if delayed, it is very probable that the roots may be injured.

As the layers grow or spindle, as it is usually termed, they must be carefully tied up to the sticks with soft worsted, or fastened with Rowland's metallic wire; after they have grown about a foot high, a top dressing of very rotten cow manure will be found very beneficial; and as the weather gets warmer they must be carefully watered, the soil in the pot never being allowed to get thoroughly dry. As the buds appear, and you have decided which to remove, they may be reduced in number, and the laterals or side buds also taken away, so that all the energies of the plants may be directed toward those that remain, and which will increase their size, if intended for exhibition. The number of these should be regulated according to the strength of the plants; some think that three flowers are enough for each layer to bring to perfection, but five, I think, is generally about the mark. The buds and plants are now subject to the attacks of various insects. The cuckoo spit is one of them, and is easily seen and removed. The green fly is more common and troublesome, but may be easily got rid of by using a small bag of Indian rubber, similar to the one here exhibited; this being filled with Scotch snuff, the buds must be examined very early in the morning, or immediately after rain, they will then be generally found clustered together, and a puff or two of snuff does their business effectually. This application of snuff may be repeated now and then even should no insect be perceptible, as it will prevent the attack of another annoyance whose presence is not so easily detected; I allude to a small black insect, which inserts itself as the flower begins to open beneath the calyx, or green outside covering, and feeds on the coloured parts of the petals, so as completely to disfigure the flower when it expands. When buds burst it is evident that there is negligence in the management, and in order to prevent this, thread rubbed with bees' wax is put round several times, and the ends merely twisted; as the buds increase in size, these are untwisted and slackened.

Some people use sheep's bladder cut into narrow strips and wetted, which causes it to stick fast, but this does not allow for the swelling of the flower; so that I am inclined to think the bees'-waxed thread the preferable tie. As the flower expands, a collar of paste-

board is placed under the guard-leaves, and the careful florist will assist his bloom as it advances, extracting all self, muddy, or misshapen petals, and arranging the others to his mind. Within these few years Rowland's metallic wire has come much into use, and by means of it each flower may be kept exactly in the place the grower wishes, without any possibility of its being removed by the wind; and he may have several flowers under a hand-glass, when fully blown which will not chafe against each other.

The flowers to be retained any length of time must, of course, be shaded from sun and rain; this is done in various ways: those who have the convenience of a tulip shed remove the pots beneath the awning; others have circular caps of paper, which is oiled or painted, a wooden socket goes through the centre, which is slipped down the stick, a small nail keeping it the required height; a more simple method still is, a small square board with a hole on one side for the stick to pass through; these are in general use, but the box of about five inches square and three inches deep, glazed at top with a single piece of glass, having a brass loop for the stick, through which a screw passes to adjust it at any height, a few turns will retain it at its proper distance over the flowers, without any chance of its slipping down upon them. At this stage of their growth they are exposed to the attacks of the ant, or pismire, and the earwig; the latter is very destructive to the blooms, eating away the bottom of the petals. They may be caught by placing the bowls of tobacco-pipes on the top of the sticks, but they must not have been smoked with, as the smell of tobacco is very obnoxious to them. Crabs'-claws are a very good substitute, and the dried hollow stalks of beans, laid on the surface of the pots, into which they will retreat, must be examined every morning and the enemy destroyed. The ants may also be killed by watching their track, when having found the nest, a dose of boiling water will generally be found sufficient.

The flowers having escaped by the vigilance of the grower, the various vicissitudes to which they are liable from the time they are planted out to the period of perfecting their bloom, the florist feels a conscious pride in exhibiting his beauties to his various visitors, and names and titles without number are brought forward in rapid succession; and Kings and Queens, Dukes and Duchesses, Squires and Councilors, Prophets and Lord Chancellors, Romans and Philosophers, Actresses and Prime Ministers, Missionaries and Doctors, Sweethearts and Soldiers, Archbishops and Racers, all pass in review; and in fact, a florist's vocabulary seems to have no end. He descants on their

various perfections, and praises their shape and colour, till he fancies himself invincible, though perhaps he may puff, and say he has no chance. The exhibition day arrives, and all his trouble and care is rewarded, provided a few of his favourite flowers are successful.

And here it will be proper to observe, that it is by no means certain that the most careful or the most extensive grower will excel at an exhibition, unless he either is a good dresser of a flower himself, or gets some one else to do the needful for him. This arranging the petals, or, as it is technically called, dressing, is an art of considerable nicety, and a grower who is an adept at preparing his flowers for the stage, has a much better chance of obtaining the prize than his neighbour who cannot "dress," even should he be otherwise an inferior grower.

Whilst on the subject of dressing, I may just observe, that many tricks are played with flowers for exhibition which are extremely reprehensible; and where the various plans are adopted, let them be viewed in what light they may, or whatever false gloss may be put on such proceedings, it amounts to nothing less than down-right cheating, and is a dead robbery on the fair exhibitor.

There have been plenty of instances, where a pod had been bursted, of putting the flower into a fresh one. I well recollect an instance of a first pan of Carnations, at an exhibition in one of the midland counties, in which one of the pods was split to the bottom, and consequently ought to have been disqualified; but by matching the pod with a piece of green silk, and tying it round close up to the petals, it escaped the scrutiny of the judges.

At another time I have seen bad leaves taken out, and good ones substituted, a pellet of cotton wool being crammed down, to keep them in their places. But this is also done in a much neater way, by drawing the petal down into the pod with a piece of green silk. And a most respectable nurseryman and florist, not a long time ago, informed me that he had seen a Carnation composed of petals taken from other flowers, not one of which belonged to the pod in which they were put, but were the best that could be selected from perhaps a dozen flowers. The result was, an unbeatable flower was made up.

In dressing Carnations, it is considered fair to remove what leaves you choose, and, with a pair of tweezers, to put them in the best and most regular form, the petals imbricating each other, with a few short ones in the centre, forming the crown; but extremely wrong to make any addition thereto from other flowers. But, to the credit of this Society, and which no doubt has tended to promote the harmony and

unanimity which has so long prevailed amongst us, no case of this reprehensible system has come under my observation during the twelve years I have been connected with it.

We must now retrace our steps; and I must direct your attention to the time when the pod bursts sufficiently to enable the colour to be distinguished. If not "run," as it is termed, or the flower a self, and the grass is sufficiently long, I commence layering. Some defer it to a later period; but where there is a large stock to operate upon, it is best to take time by the forelock: at all events, I am an advocate for early work.

Some will tell you that they are more apt to spindle; but if they had not been layered, I imagine they would have done so: and I should also think that the very act of cutting it would operate as a check; for the formation of roots must necessarily require a certain supply of sap; and, at all events, the layers should be removed when well rooted; for after they have got a large quantity of fibres they may then be getting sustenance from their own as well as the parent plant; and thus having a double allowance of nourishment, they will then be likely to spindle.

The operation of laying properly is one of some nicety, but there are many bunglers; much has been written, but it requires practice and patience to do it well. I tried last year a plan recommended by a writer in one of the floricultural publications: it was merely to cut out a notch just below a joint. It certainly had simplicity in its favour; but I must candidly say, that those thus operated upon were the worst rooted in my collection. Still I shall, if possible, give the plan another trial next season. The system generally followed, and the one that I find to answer best, is, after having provided an equal quantity of road-dust and decayed leaves, or other vegetable soils, well mixed, and a quantity of pegs, either made of braken or fern, or, what is far better, leaden ones, cast in a mould, I place my pot in a wheel-barrow, or on a low table, and take my seat in front. I then, with a sharp knife, remove the lower leaves close to the stem, and shorten the ends of the others; but, as I before observed, I am not fond of cutting away too much. When all the layers are trimmed, some of the compost must be put on the pot; and, having selected the joint to cut through, I place my finger at the back to keep it steady, and gently insert the point of a surgeon's dissecting knife, of the smallest size, in the centre of the stem, pushing it gently forward, with the edge downward, until the blade is half through, I then give the handle a slight twist, and bring the blade out below the joint on the under side, thus forming a nice tongue.



The nib is then cut back to a joint, and the piece of leaf stripped off, leaving a small bud at the bottom; it is then carefully pegged down in the fine soil which had been placed on the pot; each layer is operated on in a similar manner. When all down they have a little more soil put on them, but by no means should they be buried deep. It sometimes happens that there are shoots so high as not to be conveniently brought down to the same level as the others; when this is the case, a large piece of broken pot is placed within the rim, which holds up the soil, and makes a higher surface in which they are layered, or sometimes they will be long enough to insert in small pots placed close to the stem. After having got all the shoots down and slightly covered with soil, I place smooth flat stones about the size of a halfpenny as near as possible over the cut of each layer. This stone not only prevents the soil being washed away from that particular part, but I feel convinced it very much accelerates the rooting; for let the weather be hot, and the soil in other parts of the pot dry, if you examine beneath these stones a genial moisture will be perceived, yet the pebbles contract heat which they slowly give out much to the benefit of the layers. I must here notice the operation of piping, and though the Carnation is much more difficult to root than the Pink, yet I have adopted it with tolerable success; the great matter is to do them early, for they require plenty of time. I insert them in a light soil under a north-east wall, and having watered to settle the soil about them, when perfectly dry, they are covered with a hand-glass; they sometimes require a slight shade; this is accomplished by putting a little soil on the top of each glass, but I do not remove the glass till I see they are establishing themselves, unless any damp off, in that case they are taken away. The worms will sometimes prove injurious, both to the pipings and to the layers; when they are perceived, a little water in which hot lime has been slacked will destroy them if poured over their holes. The layers must be constantly watched, and soil added now and then, but it must be with a sparing hand; they may be watered most evenings in hot weather, but it should be with water which has been exposed to the action of the sun during the day; and but little other attention will be required till they are ready to take off.

Before concluding, some little notice must be taken of the seed. As the flowers begin to fade it is necessary to remove the withered petals; this should be done without injuring the pointals or female organs of the flower, which are like two small horns; for if allowed to remain they often contract dampness, which is fatal to the embryo seed. It is also a good

plan to slit down the pod in order to prevent any lodgment of water.

When the pods are full ripe they may be gathered, and the seed should remain in them till the following spring, and about the latter end of April may be rubbed out, and sown in shallow pans or on a bed, covering them slightly with soil; they may remain here till they are about three inches high, when they may be planted out on a moderately rich bed. It is well not to have them too strong the first winter, but the following spring the surface of the soil may be covered with a very rich compost. As the seedlings spindle, the single ones should be removed to give the others room; and should the raiser be fortunate enough to have one that strikes his fancy, he may layer it, and adopt the same means and precautions as I have before stated. In conclusion, I may observe that the Carnation sports much from seed. The Scarlet Flake, raised by the Rev. S. Wigg, was from the seed of a Purple Flake; and Piccotee seed has been sown when not a single Piccotee was the result.

#### AN ESSAY ON MAKING COMPOST HEAPS FROM LIQUIDS AND OTHER SUBSTANCES.

BY MR. DIXON.

MY farm is a strong retentive soil, on a substratum of ferruginous clay; and being many times disappointed in what I considered reasonable anticipations of good crops, I determined on a new system of manuring. At the onset I effectually drained a considerable part of my farm. My next object was how to improve its texture at the least cost; for this purpose we carted great quantities of fine saw-dust and peat-earth or bog; we had so far to go for the latter, that two horses would fetch little more than three tons in one day—one horse would fetch three cart-loads of sawdust in the same. Having brought great quantities of both peat and sawdust into my farm-yard, I laid out for the bottom of a compost heap a space of considerable dimensions, and about three feet in depth: three-fourths of this bottom was peat, the rest sawdust; on this we conveyed *daily* the dung from the cattle-sheds; the urine also is conducted through channels to wells for its reception,—one on each side of the compost heap;—common water is entirely prevented from mixing with it. Every second day the urine so collected is thrown over the whole mass with a scoop, and at the same time we regulate the accumulated dung. This being continued for a week, another layer, nine inches or a foot thick, of peat and sawdust (and frequently peat without sawdust) is wheeled on the accumulated heap. These matters are continuously added to each other during winter,

and in addition once in every week never less than 25 cwt., more frequently 50 cwt., of night-soil and urine; the latter are always laid next above the peat or bog-earth, as we think it accelerates their decomposition. It is perhaps proper here to state that the peat is dug and exposed to the alternations of the weather for several months before it is brought to the heap for admixture; by this it loses much of its moisture. Some years experience has convinced me of the impropriety of using recently dug peat; proceeding in the manner I recommend, it is superior and more convenient on every account—very much lighter to cart to the farm-yard or any other situation where it is wanted; and so convinced am I of its utility in composts for every description of soil, except that of its own character, that wherever it can be laid down on a farm at less than 4s. per ton, I should recommend every agriculturist and horticulturist that can command it, even at the cost here stated, to give it a fair trial. So retentive and attractive of moisture is peat, that if liberally applied to an arid, sandy soil, that soil does not burn in a dry season, and it so much improves the texture and increases the produce of an obdurate clay soil, if in other respects rightly cultivated, that actual experience alone can fairly determine its value.

For the conveyance of night-soil and urine, we have the largest and strongest casks, such as oils are imported in; the top of which is provided with a funnel to put the matters through, and the casks are fixed on wheels like those of a common dung-cart. For the convenience of emptying this carriage, the compost heaps are always lower at one end; the highest is where we discharge the contents, in order that they may in some degree spread themselves over the whole accumulation: the situation on which the wheels of these carriages stand while being discharged is raised considerably; this we find convenient, as the compost heap may be sloped six or seven feet high—low compost heaps, in my opinion, should be avoided. The plan here recommended I have carried on for some time. I find no difficulty in manuring my farm over once in two years; by this repetition I keep up the fertility of my land, and it never requires more than a moderate application of manure.

I am fully aware that there are many localities where neither peat nor night-soil can be readily obtained; but it is worth a farmer's while to go even more than twenty miles for the latter substance, provided he can have it without deterioration: the original cost is often trifling. On a farm where turnips or mangold are cultivated to some extent, the system here recommended will be almost incalculably advantageous; a single horse is sufficient for one

carriage—mine hold upwards of a ton each; six tons of this manure is compost with peat, or, if that is not convenient, any other matters, such as ditch scourings, or high headlands which have been properly prepared and laid dry in a heap for some time, would be amply sufficient for an acre of turnips or mangold. This manure is by far the most invigorating of any I have ever yet tried; bones in any state will bear no comparison with it for any crop; but it must be remembered that I write on the supposition that it has not been reduced in strength before it is fetched.

#### THE PEA.

For this paper we are indebted to Mr. Rogers, of Southampton, author of "The Vegetable Cultivator," a person of great experience in every department of gardening, and one whose works has been pronounced by many practical gardeners to be one of the most useful at present published.

1. Early Single-blossomed frame, a most excellent early pea, and very proper for gentlemen's gardens, where, if sown close to a south wall in November, with some sort of shelter, such as yew, fir, or such like, and as they advance in growth kept close to the wall with lines of pack thread, they will very early show bloom, when, after a few on each branch are opened, they may be topped. By these means the author has raised peas fit for gathering, above a fortnight before his neighbours. The usual height of this pea is from three to four feet; but as in this respect much depends on the weather and sort of soil, only the average height has been stated.

This pea was first noticed accidentally by a mechanic who had to go through a field of early Charlton peas, near Wingham, in Kent. The discovery was instantly communicated to Mr. Russell, proprietor of the Lewisham Nursery, who was indefatigable until he had a stock with which to supply his customers. There is another instance of the quickness of growth which the author will mention: he had an excellent crop of this sort of pea towards the end of October, from "new" seed saved from four acres sown the second week in March for stock and "roughing" (which latter has been alluded to under the head of parsley); and it is to the adoption of these means, and to the care and vigilance of the seed-grower, that we owe the perfection of the different sorts of peas at the present day; and none more than the pea now treated of, which may be had equally as true and good as it was fifty years ago.

2. Early Double-blossomed frame, a chance variety of the former, possessing nearly all its

good qualities, with the addition of a double bloom instead of a single one, which has rendered it so very popular for the first principal early crop, either in the field or garden. With both sorts hundreds of acres have been annually sown in the neighbourhood of Dartford, in Kent, for the supply of the London markets, during the season, for which waggon loads in sacks are continually going night and day.

3. Early Warwick (of late introduction), an improvement of the double frame in the pod. It is certainly a good early pea, prolific, and averaging about the height of the early frame.

4. Early Charlton, or Golden Hotspur, a charming pea, if it can be had true, of which the author has his doubts. It was the leading early pea seventy years ago, and is still good to back either of the above sorts as a principal crop. It is a prolific bearer, growing from four to five feet in height.

5. Early Racehorse. This variety is of very recent date, and has already become very popular. It is very prolific, grows to the height of not more than three feet, and is particularly well adapted for a first crop, coming into bearing ten days or more before any other sort in cultivation.

6. Bishop's Early Dwarf. The name is very appropriate, as it does not grow (except in very warm and moist seasons) to much more than a foot in height. It is very early, most prolific, and, from its dwarfish growth, a first-rate pea for forcing; it requires no sticks for support, as a regular earthing will be sufficient. All other sorts of peas—at least such as are here described—are to be sticked, otherwise the taller varieties must be excluded from small and private gardens. Sticking not only, in a great measure, protects peas from the weather, but also causes them to produce a more regular and abundant crop.

All the earliest crops, more especially those intended for culinary use, require to be sticked, or they will not come near so early; but where large quarters or acres are sown, sticks are out of the question, and recourse must be had to a regular earthing, and the final laying down to one particular aspect, and if the lines or rows run from north to south so much the better.

7. Marquis of Hastings, a fine large pea, which grows to the average height of four feet, and comes in rather late.

8. Knight's Dwarf-wrinkled Marrow, one of the best of peas, and only exceeded by the following:—

9. Knight's Green Dwarf-wrinkled, without exception the finest pea in cultivation. Its

average height is from three to three and a half feet; it comes late, is very productive, the pods being always very large and full, and the peas, when boiled, most delicious and well-flavoured. The seeds of this variety are even sweet in their dry state, and are selected in preference to any other by the birds and mice; thus the saving of the seed is attended with considerable trouble, especially in cold ungenial seasons, and renders its cultivation very expensive, but its productiveness, tenderness, and delicious flavour amply compensate for every outlay.

10. Dwarf Blue Imperial, a very productive pea, tender and fine flavoured; average height three feet. It is, and deserves to be, extensively cultivated by the cottager and market gardener.

11. Royal Dwarf, of late introduction, is good, from the average height, not exceeding two and a half feet. The pods come in clusters, and are very plentiful; it may be called a second early variety.

12. Groom's Superb Dwarf. This pea grows very dwarf, not exceeding one foot and a half in height; it comes about ten days after Bishop's Dwarf, and is equally tender and fine-flavoured, with the advantage of boiling very green. It is in much estimation for small gardens and for forcing.

13. Scymetar-podded (so called from the shape of the pods), is a fine pea in taste and flavour, but does not yield quite so well as some others. It may be classed as second early, and averages three feet in height.

14. Green Woodford, or Nonsuch. This sort boils remarkably green, and is even greener in its dry state than any other variety. The height is three feet. It is very prolific, but the peas, unless gathered young, are not the most delicate, as they have rather thick and tough skins. It is an excellent market pea, and mostly cultivated as such. It comes in at the same time as the Scymetar-podded.

15. Dwarf Blue Prussian, a well known and excellent pea. At one time it was sadly run out; but, from the care taken by the seed-growers, it may now be had in its primitive state. These peas come late, which renders them most useful to sow with the early sorts in spring, and in the course of the summer, so that the luxury of a daily dish of green peas will not be wanting, as the tall marrows follow up so closely. Blue Prussians, when dressed, are of the finest green, and very tender; no other sort produces a more regular crop. The average height is about three feet.

16. Royal Victoria, a fine large marrow pea. From its recent introduction, the author has not been able to give it a trial, but he is informed it is of first-rate quality.

17. **Matchless Marrow.** This is a large pea, very productive, and fine marrow-flavoured. It comes rather late, and grows from four to five feet high, and will therefore require tall sticks.

18. **Blue Spanish Dwarf** is very similar to **Groom's Superb**, as is likewise the **Spanish Dwarf**, or **Fan** to **Bishop's Dwarf**. There is but little or no difference between them: they are mentioned only on that account.

19. **Oyster Pea**, so called from a singular roughness on the outside of the pods. It is a fine pea, and very useful for a late crop. The average height is about four feet.

20. **Waterloo**, a fine large pea, and good for a late crop. It averages four feet in height, and is an abundant bearer.

21. **Tall Marrow.** This variety has long been cultivated in our gardens under the above name. It was formerly considered an excellent and delicious pea, but in consequence of the superiority of some other kinds, it has lost its high character, and is now but seldom planted.

22. **Original Dwarf Marrow.** Its height averages from four to five feet. It has been wrongly named, but it has gone by this appellation during the last century. The true sort is nearly extinct, as what is at present sold for the dwarf marrow, though a good pea, grows much higher than the original, and the seed is more round and smooth. The seed of the original sort was much larger, and the outside of the seed or pea had a rough coating. It was a most prolific bearer, especially when it had sticks to run on.

23. **Dwarf Sugar Pea** is of ancient date, having been first introduced from Holland above 100 years ago. It is a prolific bearer, and excellent for the purpose of stewing, as before-mentioned. There is a tall variety of the sugar pea, but the dwarf sort has nearly thrown it on the shelf. The average height of the dwarf is from twelve to eighteen, or more.

24. **Knight's Tall Wrinkled Marrow Pea**, of high repute from its superior qualities. It would be more cultivated but for the large space of ground which it requires, and the great height of sticks, which are not at all times to be obtained, as they ought to be from eight to ten feet high.

25. **Knight's Tall Green Marrow Pea**, of late introduction, is a most excellent late pea; and, if sown in the beginning of July, will keep in gathering till October. It is very prolific, and for all culinary purposes is in as high estimation as the dwarf variety.

26. **Tall Imperial**, a fine pea, but in no way superior either to **Knight's Green Marrow** or the **Green Nonpareil**. Average height from six to eight feet.

27. **Nonpareil Marrow** should be good from the name. It is a fine late and prolific pea, and should have a place with others of a similar nature. Average height from six to eight feet.

28. **Egg Pea**, so called from the large size and shape of the seed. This is one of the largest marrow varieties at present in cultivation. It is certainly a fine pea and a prolific bearer, when it has sticks of a sufficient height to support it. The average height is from seven to eight feet.

29. **Spanish Marotto**, which, with the next mentioned variety, were leading peas at the first tables during the reign of George the First, but neither of them are at the present time in much repute. Still the **Spanish Marotto** will be found very useful where there is a large family to be supplied, as they keep in gathering some time longer than many other sorts, but they should have sticks, as the pods are large, and generally well filled; the average height is from five to seven feet.

30. **Roundeiva**, an old inhabitant of this country. There are four varieties, but the white and green are the best. They are very prolific, and, like the **Egg Pea** and **Spanish Marotto**, very hardy, which qualities render either of them very beneficial to the cottager who can procure sticks to support them, such being absolutely necessary for their full production; the average height is about six feet.

One property in the **Roundeiva** pea is, that it bears the droughts of summer better than most other kinds. Neither it, however, nor the **Spanish Marotto**, is so delicate eating as many others, and they are both now nearly out of date.

#### THE PROGRESS OF FLORICULTURE.

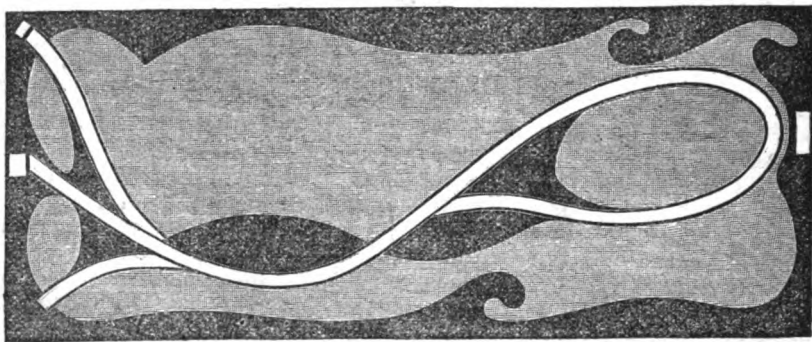
As we hope it will be conceded that we have done our part towards advancing the beautiful science of floriculture, we are vain enough to endeavour, from time to time, to trace some of the effects of our exertions in the improvement of those objects which we have especially pointed out, as offering fair opportunities of success; for, be it remembered, that there have been the same means at work for many years that have been used since our work started into life; and that the rapid improvement now has been effected more by the direction of taste to choose what is really desirable, than it has by any increased energies on the part of the growers. Twenty or thirty years ago, we have seen twenty or thirty thousand seedling plants of a show flower, and for want of taste in the selection of the best to seed from again, or the best to retain for collections, the whole mass has, season after season, been consigned to the

markets. Not so now; people are no longer ignorant of what are good properties: a man will, before he sends his thousands to market, save those which come nearest to our standard, and seed from them again. But let us not be understood to claim for ourselves the first movement in this Floricultural revolution.— We trace it back to 1832, when Mr. Glenny, after many years of quiet experience, began to publish his notions on Floriculture; previous to this, however, in the days of Gable, whose pupil he was, he had attended shows, and produced his flowers only to be beaten, and from that time downwards had been forming his notions. In 1832, he had begun to work in earnest; the *Horticultural Journal*, which was a sort of magazine newspaper, he began to write of the properties of flowers; the same year the Metropolitan Society was founded by him, and a few floricultural friends who fancied him a floricultural star, supported him through thick and thin; toasted him at public meetings, rallied round him on all occasions, and after hearing his reasons for adopting certain points in his judgment of flowers, agreed in all the essential properties of the tulip, the dahlia, and some other flowers. So long as he flourished they supported him. His next public demonstration was to establish for the gardening world *The Gardener's Gazette*, a complete newspaper, which, when fully supported, superseded *The Horticultural Journal*. In these works were many essays on the properties of flowers, many more on the evils which operated against the progress of the science, many bitter imprecations against pretenders, jobbers, cheats, and enemies to Floriculture, many denunciations of bad judgment at shows; and it has been conceded by many who are interested in the success of the Horticultural Society, it was his withering articles, which forced the managers by degrees to change their public exhibitions, from the most inefficient, imperfect, and improperly conducted that can be conceived, to what they are at present. But the time came when the paper passed from his hands only to be ruined, a change of circumstances threw him into the shade, and then it was, that the science retrograded. The Metropolitan Society, like himself, was neglected by those who had profited most by its operations; adventurers and pretenders began to read his writings on Floriculture and call them their own lectures; a newspaper was established in opposition to the old one; and there was nothing like union from one end of the fancy to the other. Still there were societies which held all the original laws laid down to be good, who sought Mr. Glenny's assistance as a judge, and the system he had laid down, the lessons he had taught, prevailed in many great places. It

was in this state of things that the proprietors of *The Gardener and Practical Florist* conceived the notion of a garden library, upon the plan of some other popular works, and one of the first objects was to ascertain upon what terms they might collect all that had been written by Mr. Glenny, upon the properties of flowers, and add to the number upon which the properties were laid down; and we do not hesitate to affirm, that to this collection, and the additions we occasionally make, may be attributed the revival of the science among florists' flowers, and the still further advancement which has been secured. Let us then, without taking credit for originating the measures of improvement, at least claim to have given Mr. Glenny an opportunity of being again useful, and of disseminating his writings on the properties of flowers in more thousands of copies than he had ever previously in hundreds. It is Mr. Glenny's own fault that we have not had more of his papers; but, never very gentle in his mode of handling an opponent, a sense of neglect and injury had made him altogether uncontrollable, and had he not fortunately returned to *The Gardener's Gazette*, which acts as a safety valve, we fancy there might have been a rupture, in spite of our desire to retain his services. To our usefulness in a general way Mr. Glenny has contributed but little, but when he has been fastened down to the practical business of growing and explaining the properties of a flower, the thousands that have been sold will best testify his use, and there have been some, which notwithstanding our supposing each time that we have provided for all possible demands, have been reprinted five or six times, and at length stereotyped. As we intend to trace the improvement of many flowers to our little publication, it was fair to explain the part which others have borne in the service, and however much the work may be indebted to particular writers, the floral world will be found indebted to the work. Let us take any flowers that we have for the first time taken up, with a view to explain the properties. The Cineraria will do, see the narrow petalled character of the star-like flowers of two years ago, look at our diagram of what they should be, and, extravagant as it appears to demand for perfection, a circle instead of a star, you will find already a very near approach. Look at the Petunia, read what we have published, and then take some of the present magnificent varieties, and see whether they are not rapidly approaching our dictum. See the Pansey, which for a considerable period before we started, never produced one valuable addition, but on the contrary retrograded, and by help of improper recommendations increased fearfully in the spurious and

worthless kinds, and you will find a decided advance since our work began to operate; but the present season will afford us many opportunities of showing the part we have taken has been of use. The properties of the Rhododendron and Azalia, of the Camellia Japonica, the Carnation and Piccotee, the Pink, &c. will all have had their effects, not only in causing more people to grow seedlings, but in causing the best instead of the worst to be saved and esteemed. Look at Mr. Smith's White Azalia, Phœnecia, Alba, as an improvement on the old one. See many of the purple varieties as an improvement on Phœnecia, and expect in a few seasons both Alba and Phœnecia to be thrown away. See the decided improvements upon the Rhododendron, and prepare yourself for the substitution of better things, for every

Ponticum in the land, the owner of which can graft, and get a scion to put on: in short, we are touching upon flowers which would occupy an essay each, and shall leave them for the present, merely urging all those who possess the work to look well to all the papers and diagrams on the properties of flowers, and compare the new flowers with old ones, and, those who do not possess it, to obtain it forthwith. We have no hesitation in saying that it stands alone as a sound practical adviser, which should be in everybody's hand who possesses a garden, or who hopes hereafter to possess one, and considering that we have resources which are almost endless, we shall be greatly disappointed if we cannot make every new volume a distinct work, and each of them, in utility and novelty, surpass its predecessor.



### LANDSCAPE GARDENING.

SUCH a title seems quite farcical when applied to laying out a bit of garden thirty-four yards long, and fourteen yards wide; yet the smallest plot of ground may be made frightful, formal, or picturesque, according to the taste of the owner, or the people he employs. There are principles which cannot be carried out on a small scale, but there are also features which may be adopted with advantage. There are few landscape gardens, or parks laid out as gardens, within the public range. The only one we know of near London, is the ornamental portion of St. James' Park, yet in that there is an utter absence of all the main features which distinguish well arranged landscapes; the planting is unnatural; the grouping of the plants abominably bad; the choice of the subjects still worse. Had the job been handed over to some nurseryman who wished to clear off a stock of coarse old stuff which nobody else would buy, and he was totally regardless of all consequences to his character, and used them all up to get rid of them, it would be impossible to have planted a place worse, or to have jumbled so many things out of place, or to have

run anybody to so much cost for so little purpose. We recommend our readers, who are within reach of the place, to walk about a little among the hurdles and dead shrubs in St. James' Park, see in how many different parts the view of the Palace is planted out, observe how the tall shrubs occupy front places, and dwarfs are huddled together behind; notice how many scores of one common sort of tree disfigure a group, and how informal and detached, how incongruous and out of keeping, not only the clumps, but all the plants in the clumps, are. Nor are these faults to be looked at with any allowance for circumstances. The place was not the park of a poor commoner, or spendthrift gentleman, who wanted to look very large with little money; there was no cause for parsimony; the public never yet grumbled, or set their representatives grumbling, at the cost of anything they were permitted to enjoy. There was no earthly excuse for employing a man who did not know his business, nor for curtailing the proper expenditure for any one who did. The entire plot is within sight of the Palace; the sovereign could hardly move out

without seeing many parts of it; yet nothing can meet the eye of taste without offending it; not a feature is pleasing or perfect, very little, if any, is even tolerable. We can only imagine one cause for the bad plan, and one for the bad plants. The first is,—the person who laid it out went to work without any acknowledged object but to plant a lot of subjects; and second—that these were provided by sending some very ignorant person to sales, to buy whatever could be got cheap, out of the ruins of broken down nurseries. The first consequence was, that the clumps and patches which are planted are “some so big, some so big, and some so big,” (like the books ordered for an ignorant but wealthy man’s library,) and are placed without an object, and planted without any good effect. There is nothing easier than finding fault; but he who does so without occasion, loses his own, instead of lessening another’s, claims. It would ill become us to be enforcing any argument at the expense of truth, or pretending there are faults when there are none, while the proofs are at hand. In some cases there may be difference of opinion, but there can be none as to the bad management of the St. James’ Park plantations. It is true that the hurdles spoil the appearance, but the hurdles have not turned proper shrubs into common lilacs and scrubby box; the hurdles have not caused shrubs to die, nor to grow in places where they had not been planted. The park ought to have been made the finest bit of landscape gardening in the kingdom, whereas it is immeasurably the worst, if, indeed, it deserves that name at all. There would be some excuse if the place were constructed to imitate a wood, but it is like nothing, but vile patches of trees and shrubs, ill chosen, ill grouped, ill placed; calculated to destroy all the appearance of space, to circumscribe the beauties of the royal domain, conceal all that nature and art have done well, expose all the natural deformities, and to add greatly to their number. We are among those who think the heaps of paving stones along the margin of the lake, abominations. If they are intended to imitate anything, they should be at once placed in their positions; at present they appear like nothing but litter left about by masons, bricklayers, and road menders, disfiguring wofully the island along its whole water’s edge, and spoiling the entire scene. In gardening, according to our principle, we exhibit space to the best advantage, whereas our St. James’ Gardener, whoever he may have been seems just as anxious to conceal it. According to our plan we should have made every clump exhibit, either the leading varieties of some particular family of plants, or a fine contrast of foliage. According to our notions the main feature would

have been carried out by evergreens, and the deciduous trees should have been a secondary feature, or be seen towering above the evergreens, but without disturbing the harmony of a plantation, that should have been as gay in winter as in summer. In these clumps we have common tall deciduous trees in the front, short evergreens behind, and sundry scrubby or dead box, and holly, intermixed in glorious confusion; here and there we have a subject honoured with a sort of tomb-stone, in some cases recording the living history, in others “In memory of.” The only interesting and appropriate feature in the whole plantation is the collection of willows (*silex*) along the banks of the canal. There ought, however, in a national garden like that, to have been, independently of any quantity used in the plantation, collections of Holly, Arbutus, Privet, Firs, Honey-suckle, Rhododendron, Hardy Azalia, Andromeda, Lilac, Acacia, Laburnum and Cytissus, and many other genera grouped in favourable situations for display, and calculated to diversify the features of the landscape and give interest to the scene. Our little sketch at the head of this article is another of the hundred and one designs for the garden of a house in a row, between four brick walls, where all that can be done towards breaking in upon the formality is but little. The lines, represent grass, the black, clumps and borders thickly planted with shrubs, while the path is clearly defined. We had no occasion to travel into the park to speak of our own plans, but, public attention has already been called to the fact, that it is a reproach to English gardening, and as one of the works devoted to the subject, it becomes us to notice it. How we could better do it than under the head of Landscape Gardening we do not know; and in continuing our sketches of villa gardens, we have touched upon the subject, hoping that those who read will go and judge for themselves, and tell us whether, if we ought not to have said more, we could with propriety have said less.

#### GRAFTING THE GERANIUM.

SEEING some of Mr. Ansell’s (of Camden Town) Geraniums, grafted on stocks of the quick growing kind and exciting considerable attention, I think the following paper on that subject by Mr. Reid, a correspondent of a work which deserved a better fate than it met with, should be preserved in your miscellaneous and library-like book; and I wish such of your correspondents and readers as may discover good practical articles in prints almost unknown, would endeavour to make them useful by doing as I have in this case done. I have done nothing but cut away a few sentences which lengthened but not improved it. “It

has been," says Mr. Reid, "a matter of surprise to me for several years, when so much attention has been paid to the cultivation as well as the raising of new varieties of *Pelargoniums* (which has been fully demonstrated at all the floricultural exhibitions in the kingdom) that neither amateurs, nor my more intelligent brethren, should pay so little attention to grafting that beautiful tribe of plants. I think, if it were more generally known, it would be more extensively practised. It is not only for the novel and interesting appearance of a plant with six or more distinct varieties on the same stem, that I would recommend this mode of culture; but it will be possible to grow four times the number of varieties in the same house to equal perfection; and in some cases (particularly the weak growers) I think better; so that the proprietors of small greenhouses, instead of throwing away annually many of the good old kinds, to make room for new ones, they might graft half-a-dozen or more upon one stem, for the sake of preserving the varieties. I therefore forward to you a few remarks on the method that I have practised in grafting the *Pelargonium* for the last ten years with the utmost success, which, if you think them of sufficient interest for insertion in your valuable Magazine, I shall be glad to see them inserted. In the first place, it is requisite to choose a few of the healthiest and strongest grown plants, two or three years old, with as many shoots on each as can be found. I would not recommend older plants, for they never grow so well as young ones. I have generally been in the habit of putting in a few cuttings of the strongest growing kinds that I could find for stocks, in the ordinary manner of striking cuttings, and pot them off as soon they are struck; then put them into a frame and shade them, until they have made fresh roots; then pinch off the leading shoots to keep them dwarf, and make them push lateral shoots each. After they begin to grow, a little manure water occasionally will be of service to them, as it will make them grow much stronger, and the success of grafting a great deal depends upon having well-grown stocks. Repot them into a size larger pots in the course of the summer, and cut them down in August to within three eyes of the base of each shoot; then treat them the same as the other plants. The stocks should be repotted into a size larger pots about a month before they are wanted, and cut down to a clear grown part of the shoot, about two inches from the last year's wood, two or three days previous to grafting, to allow the exuberant sap to escape; it is of little consequence what time of the year from March to August the work be performed, as they will grow well all the summer, but I have

generally found them do the best in June or July, as both stocks and scions are much firmer than they are at an earlier period of the year, and, consequently, not so liable to rot, a disease the operator will find an evil the most difficult of any that he will have to contend against. After the stock has done bleeding, the operator must select a number of well-ripened shoots, about three inches long, for scions, from such kinds as he thinks proper, which ought to be as dissimilar kinds as possible, and much of the same habit; for if strong and weak kinds be put upon the same plant, the strong kinds will injure the weaker ones. There must be no more leaves dressed off than possibly can be avoided. I have tried several different methods of grafting them, and I have always found, that side, or whip grafting, without the tongue, to answer the best; if they be put on with a tongue, the latter generally rots, and either causes a bad joint, or the death of the shoot altogether. The operator must be provided with a sharp knife (the thinner the better), some damp moss and ligatures of cotton wick or bass matting; then take a scion in the left hand and a knife in the right, and make a slooping cut right through the scion, about an inch and a half long, then a similar cut upwards in the stock, but no deeper than to admit the inner rind of the bark in the scion to touch both sides of the bark in the stock; then tie them together; be careful in tying not to bruise the bark, as that would cause the shoot to rot; then take a little moss, and tie it pretty tight round, about an inch above the wounded part, and increase it to the size of an egg, and then proceed with the rest of the shoots. After they are all done, remove the plant into a gentle hotbed or pit (if they are at hand), if not, into the greenhouse, and shade them until they begin to grow, and sprinkle them with water once a day to keep the moss from getting dry, and it will encourage the shoots to grow. After they begin to grow, the moss may be unloosed, and laid loosely on again for a few days longer, and then taken away altogether. If any of the shoots appear to be twitched, they may be unloosed and tied over again rather slacker; it will require great care, as they are very tender for a long time after they are united, and are very easily broken out. It will be necessary to put a short stake to each shoot, to prevent the wind or anything else from breaking them off, then remove them to the greenhouse, and attend to them the same as the other." This is one of the most amusing experiments for amateurs, unless we except budding, which gives the same opportunity. Mr. Ansell made some of his standards, and I considered them quite a novelty, at all events it will afford amateurs considerable amusement, and if they succeed, I may add gratification.—T.



## Encyclopædia of Flowers.

### A TREATISE ON THE CULTURE OF THE ANEMONE.

THERE is scarcely a more useful flower than the Anemone in an open garden, flowering almost all the winter if it be mild, bearing an extraordinary degree of hardship, growing in almost any soil, multiplying itself without any trouble to the cultivator, and easily raised from seed, moreover comprising a great diversity of colours, we can hardly imagine a more desirable assistant in contriving the succession of blooms for beds and borders. The Anemone is essentially a florist's flower, but the Dutch are far before us in the production of new varieties. Miller gives us the particulars of eight kinds. *A. Sylvestris*, *A. Nemorosa*, *A. Apennina*, *A. Virginiana*, *A. Coronaria*, *A. Hortensis*, *A. Dichotoma*, and *A. Thalictroides*. The florist has been busy in knocking some of these distinctions on the head, but we propose to describe them as they were, and then to make a few remarks upon the changes that have been wrought, and proceed to a consideration of the best mode of cultivating them in perfection. We shall take the authority of Miller for the description of the eight kinds.

The first sort, *Sylvestris*, grows naturally in many parts of Germany; this approaches near to our wood Anemone, but the seeds of it are round and hairy; the flower is large and white, but having little beauty, is seldom planted in gardens.

The second sort, *Nemorosa*, grows wild in many parts of England, where it flowers in April and May, making a pretty appearance in those places where they are in plenty. The roots of this may be taken up when their leaves decay, and transplanted in wildernesses, where they will thrive and increase greatly, if they are not disturbed; and in the spring, before the trees are covered with leaves, they will have a very good effect, in covering of the ground and making a pleasing variety at that season.

The third sort, *Apennina*, is found growing naturally in some parts of England, but particularly at Wimbledon, in Surry, in a wood near the mansion-house, in great plenty; but it is not certain that they were not originally planted there, as they are not found in any place in that neighbourhood. This sort flowers at the same time with the former, and when intermixed with them, make a fine variety. This may be transplanted from the wood as the former.

There are of these two sorts, some with double flowers, which have been obtained from seeds. These make a finer appearance, and

continue longer in flower than the single, but are only to be procured from the gardens, where they are cultivated. As these are only seminal varieties, I have not enumerated them with the others.

The fourth sort, *Virginiana*, grows naturally in North America, from whence the seeds are frequently sent to England. This is a very hardy plant, and produces plenty of seed in England, but having little beauty, scarce deserve a place in gardens, unless for the sake of variety.

The fifth, *Coronaria*, and sixth, *Hortensis*, are natives of the east, from whence their roots were brought originally; but have been so greatly improved by culture, as to render them some of the chief ornaments to our gardens in the spring. The principal colours of these flowers are red, white, purple, and blue, and some are finely variegated with red, white, and purple. There are many intermediate shades of these colours; the flowers are large and very double, and, when properly managed, are extremely beautiful. I shall therefore proceed to give ample directions for their culture, which, if duly observed, every person may have these flowers in perfection.

The seventh sort (*Dichotoma*) grows naturally in Canada, but is a mere weed, bearing a white flower and multiplying very fast. The eighth sort (*Thalictroides*) is indigenous to the woods of North America, the leaves are like meadow rue, and the flowers small and double as well as single: modern writers record more than fifty species, with about as much propriety as if we were to set down all the varieties of apples as different species. Miller was much nearer right, as some of his distinctions do not appear to mix so readily, and are well kept up to the present day. The two distinctions, *Coronaria* and *Hortensis*, seem to have furnished the florists with those numerous varieties which Loudon, in his Encyclopædia of Plants, erroneously states are not named by the raisers; whereas, a little further enquiry would have shown that the Anemone, like all other flowers, was not only sure to be named if good for anything as a variety, but that it, like other flowers, very often got named when it was not. The Anemone presents itself in two very distinct forms; and one has already been recognised as an approach towards perfection. The outer petals forming a large bottom dish, and the centre a half globular heap of florets in the centre. The dish is mostly of one colour, and the contents of another, and thus afford a great diversity

of appearance, and makes many distinctions upon which the florist builds a name. The other form of the Anemone is the dish as before described, and the bunch of seed only in the middle; in this state the flower is almost like a shallow tulip; and from this, which is called the single Anemone, we stand a chance of obtaining a new race of double flowers approaching the Ranunculus. As a sort of approach to this, we remember at one of the Metropolitan Society's evening meetings to have seen a small collection of exceedingly bright flowers, with two, three, and some four rows of the outer or dish-like petals, and inferred from these the possibility of obtaining enough to fill up a flower, and hide the seed vessel as in the case of the Ranunculus. This, however, will be a work of time; some portions of the seed of these semi-double flowers were afterwards distributed among the readers of one of the papers or periodicals of the day; and we wish we could hear whether any of the raisers were successful in raising, and if they had many more rows of petals. This, however, may lead people to try, for if they once come like the Ranunculus, the present double flower (so called,) must go into a second class. The culture of the Anemone was as well understood nearly two hundred years ago as it is now, but perhaps few have taken the trouble to learn all that was then known; and strange as it may appear, all experimentalists, upon the attempted changes, have been glad to throw the new fangled theories overboard, and go back to Father Miller, or his predecessors. The spirit of his directions may be found in the following observations:—

Take a quantity of fresh untried earth (from a common, or some other pasture land) that is of a light sandy loam, or hazel mould, observing not to take it above ten inches deep below the surface; and if the turf be taken with it the better, provided it hath time to rot thoroughly before it is used: mix this with a third part of rotten cow dung, and lay it in a heap, keeping it turned over at least once a month for eight or ten months, the better to mix it, and rot the dung and turf, and to let it have the advantages of the free air: in doing this be careful to rake out all great stones, and break the clods (but by no means sift or screen the earth, which is found very hurtful to many sorts of roots); for when the earth is made very fine, upon the first great rains of winter or spring, the small particles thereof join closely together, and form one solid mass, so that the roots often perish for want of some small stones to keep the particles asunder, and make way for the tender fibres to draw nourishment for the support of the root.

This earth should be mixed twelve months

before it is used, if possible; but if you are constrained to use it sooner, you must turn it over the oftener, to mellow and break the clods; and observe to rake out all the parts of the green sward, that are not quite rotten, before you use it, which would be prejudicial to your roots, if suffered to remain. The beginning of September is a proper season to prepare the beds for planting (which, if in a wet soil, should be raised with this sort of earth six or eight inches above the surface of the ground, laying at the bottom some of the rakings of your heap to drain off the moisture; (but in a dry soil, three inches above the surface will be sufficient): this compost should be laid at least two feet and a half thick, and in the bottom there should be about four or five inches of rotten neat's dung, or the rotten dung of an old melon or cucumber-bed, so that you must take out the former soil of the beds to make room for it.

And observe in preparing your beds, to lay them (if in a wet soil) a little round, to shoot off the water; but in a dry one, let it be nearer to a level; in wet land, where the beds are raised above the surface, it will be proper to fill up the paths between them in winter, either with rotten tan or dung, to prevent the frost from penetrating into the sides of the beds, which often destroy their roots. The earth should be laid in the beds at least a fortnight or three weeks before you plant the roots, that it may settle; and when you plant them, stir the upper part of the soil about six inches deep, with a spade; then rake it even and smooth, and with a stick draw lines each way of the bed at six inches distance, so that the whole may be in squares, that the roots may be planted regularly: then with your three fingers make a hole in the centre of each square, about three inches deep, laying therein a root with the eye uppermost; and when you have finished your bed, with the head of a rake draw the earth smooth, so as to cover the crown of the roots about two inches.

The best season for planting these roots, if forward flowers, is about the latter end of September; and for those of a middle season, any time in October; but observe to perform this work, if possible, at or near the time of some gentle showers; for if the roots are planted when the ground is perfectly dry, and there should no rain fall for three weeks or a month after, they will be very apt to grow mouldy upon the crown, and if they once get this distemper, they seldom come to good after.

You may also reserve some of your Anemone roots till after Christmas, before you plant them, lest by the severity of the winter your early planted roots should be destroyed, which sometimes happens in very bad winters, especially in those places where they are not

covered to protect them from frost: these late planted roots will flower a fortnight or three weeks after those which were planted in autumn, and many times blow equally as fair, especially if it prove a moist spring, or that care be taken to refresh them gently with water.

But then the increase of these roots will not be near so great as those of your first planting, provided they were not hurt in winter; and it is for this reason all those who make sale of these roots, are forward in planting; for although it may happen, by sharp pinching frosts in the spring, that their flowers are not so double and fair as those planted a little later, yet if they can preserve the green leaves of the plants from being injured, the roots will greatly increase in bulk; but in such gardens where these flowers are preserved with care, there is always provision made to cover them from the injuries of the weather, by arching the beds over with hoops, or frames of wood, and covering them with garden-mats or cloths, in frosty nights, and bad weather, especially in the spring of the year, when their buds begin to appear; for otherwise, if you plant the best and most double flowers, the black frost and cutting winds in March will cause them to blow single, by destroying the thorn that is in the middle of the flower; and this many times hath occasioned many people who have bought the roots, to think they were cheated in the purchase of them, when it was wholly owing to their neglect of covering them, that their flowers were single.

In the beginning of April your first planted roots will begin to flower, which will continue for three weeks or more, according to the heat of the weather, or the care taken in covering them, during the heat of the day, with mats or cloths: after these are past flowering, the second planted sorts will come to succeed them, and these will be followed by those planted in the spring; so that you may have these beauties continued for near two months together, or sometimes longer, if the season prove favourable, or proper care is taken to shade them in the heat of the day.

The beginning of June, the leaves of your first blown roots will begin to decay; soon after which time you must take them out of the ground, clearing them from decayed stalks, and washing them, to take the earth clean from the root; then spread them on a mat in a dry shady place till they are perfectly dried, when you may put them up in bags, and hang them out of the reach of mice, or other vermin, which will destroy many of the roots if they can come at them.

Observe also to take up the latter planted roots as soon as their leaves decay; for if

they are suffered to remain long after in the ground, and there should fall some showers of rain, they would soon put forth fresh fibres, and make new shoots, when it would be too late to remove them: at the time when you take up the roots, is the proper season for breaking or parting them, which may be done by separating those that you would choose to make all possible increase from, into as many parts as you can conveniently, provided each one of them have a good eye or bud; but those you intend to blow strong, should by no means be parted too small, which greatly weakens their flowering.

The principal colours in *Anemones* are white, red, blue, and purple; and these in some of them, are curiously intermixed; but the most prevailing colours amongst our English raised *Anemones*; are white and red; though of late we have received from France great varieties of blues and purples, which are exceeding fine flowers, and being intermixed with the English flowers, make a fine variety; we should therefore observe, in planting the roots, to distribute the different colours, so as to make an agreeable mixture of each in every bed, which will greatly add to their beauty.

#### FROM SEED.

But since all the fine varieties of these flowers were first obtained from seeds, no good florist, that hath garden room, should neglect to sow them: in order to which, we should provide ourselves with a quantity of good single (or what the gardeners call *Poppy Anemones*) of the best colours, and such as have more leaves than common, and have other good properties; these should be planted early, that they may have strength to produce good seeds, which will be ripe in three weeks or a month's time, after the flowers are past; when you must carefully gather it, otherwise it will be blown away in a short time, it being enclosed in a downy substance. You must preserve this seed till the beginning of August, when you may either sow it in pots, tubs, or a well prepared bed of light earth: in the doing of it you must be careful not to let your seeds be in heaps, to avoid which is a thing little understood. Obadiah Lowe, gardener at Battersea, for several years raised large quantities of these flowers from seeds, his manner was thus:—

“After having levelled his bed of earth, in which he intended to sow his seeds, he rubbed the seeds well between his hands, with a little dry sand, in order to make them separate the better; then he sowed them as regularly as possible over the bed; but as these seeds will still adhere closely together by their down, he took a strong hair brush, with which he gently swept over the whole bed, observing not to

brush off the seeds; this brush will so separate the seeds, if carefully managed, as not to leave any entire lumps; then gently sift some light earth, about a quarter of an inch thick over the seeds; and, if it should prove hot dry weather, it will be advisable to lay some mats hollow upon the bed in the heat of the day, and now and then give them a little water; but this must be given gently, lest by hastily watering you wash the seeds out of the ground; but be sure to uncover the bed at all times when there are gentle showers, and every night, that the seeds may have the benefit of the dews; and as the heat of the weather decreases, you may begin to uncover your bed in the day time also. In about ten weeks after sowing, the plants will begin to appear, if the season has proved favourable, or your care in management hath not been wanting, otherwise they many times remain a whole year in the ground. The first winter after their appearing above ground, they are subject to injuries from hard frosts, or too much wet, against both of which you must equally defend them; for the frost is very apt to loosen the earth, so that the young plants are often turned out of the ground, after which a small frost will destroy them; and too much wet often rots their tender roots, so that all your former trouble may be lost in a short time for want of care in this particular; nor do I know of any thing more destructive to these tender plants, than the cold black frosts and winds of February and March, from which you must be careful to defend them, by placing a low reed fence on the north and east sides of the bed, which may be moveable, and only fastened to a few stakes to support it for the present, and may be taken quite away as the season advances, or removed to the south and west sides of the bed, to screen it from the violence of the sun, which often impairs these plants when young."

As the spring advances, if the weather should prove dry, you must gently refresh them with water, which will greatly strengthen your roots; and when the green leaves are decayed, if your roots are not too thick to remain in the same bed another year, you must clear off all the weeds and decayed leaves from the bed, and sift a little more of the same prepared good earth, about a quarter of an inch thick over the surface, and observe to keep them clear from weeds during the summer season, and at Michaelmas repeat the same earthing; but as these roots so left in the ground, will come up early in the autumn, the beds should be carefully covered in frosty weather, otherwise their leaves will be improved, whereby the roots will be weakened, if not destroyed. If your roots succeed well, many of them will flower the second

year, when you may select all such as you like, by marking them with a stick; but you should not destroy any of them until after the third year, when you have seen them blow strong, at which time you will be capable to judge of their goodness; for until the roots have acquired strength, the flowers will not show themselves to advantage.

By this time your roots will be too thick in the seed-bed to remain, therefore you must, as soon as their green leaves are decayed, sift the earth of your bed through a very fine sieve, in order to get out the roots, which cannot be otherwise found, as being small, and so nearly the colour of the ground; but in doing this, observe not to disturb the ground too deep, so as to endanger the burying any of the roots; for, notwithstanding all your care, many small roots will be left behind, therefore as soon as you have sifted your whole bed, and taken out all the roots you can find, you must level the earth of your bed again, and let it remain till next year, when you will find a plentiful crop of roots come up again; the young roots which you take up must be dried, as was directed for the old ones, but should be planted again three weeks before them, that they may increase in strength, so as to flower strongly the succeeding year. The single (or Poppy) Anemonies will flower most part of the winter and spring, when the seasons are favourable, if they are planted in a warm situation, at which time they make a fine appearance, therefore deserve a place in every flower-garden, especially as they require little culture; for if these roots are taken up every other year, it will be often enough; and when they are taken up, they should be planted again very early in the autumn, otherwise they will not flower till the spring. There are some fine blue colours amongst these single Anemonies, which, with the scarlets and reds, make a beautiful mixture of colours; and as these begin flowering in January or February, when the weather is cold, they will continue a long time in beauty, provided the frost is not too severe. The seeds of these are ripe by the middle or end of May, and must be gathered daily as it ripens, otherwise it will soon be blown away by the winds.

The Anemone grows naturally in the Levant, particularly in the islands of the Archipelago, where the borders of the fields are covered with them of all the colours, but the flowers are single, and have been greatly improved by culture. In France they were long cultivated before they were much known in Holland or England. Tournefort mentions two French gentlemen, Messrs. Malaval and Bachelier, who contributed greatly to the improvement of these flowers; and of the latter

he relates a pleasant story, as follows :—There was a certain lawyer to whom Mr. Bachelier had refused to communicate the seeds of his fine Anemonies, and finding he could not obtain any either by friendship or money, a fancy came into his head, to make a visit to Mr. Bachelier, with some of his friends who were in the secret; he ordered his lacquey who supported the train of his gown, to let it drop on a bed where the Anemonies grew, which he wanted, whose seeds were then ripe. They walked a considerable time talking on various subjects, and when they came to the spot where the Anemonies grew, a merry gentleman of the company began a story, which engaged the attention of Mr. Bachelier; at which time the lacquey, who was no fool, let fall his master's train over the bed, and the seeds having a downy covering, stuck to the gown, which the boy afterwards took up again, and the company went forward. The virtuoso took leave of Mr. Bachelier, and went directly home, where he carefully picked off the seeds which had stuck to his robes, and sowed them, which produced very beautiful flowers.

#### IMPROVING THE RACES.

The best mode of commencing to grow seedlings is to be very particular where you obtain the seeds, for if you begin with a wild bad strain saved from ordinary flowers, where they have from year to year been degenerating, you will be ten years, with all the pains you can take, before you can get even with those who are at work. Probably the best thing we can recommend is to look about among nurserymen and florists, and mark some of the best of the single or semi-double flowers you can find in their flowering-beds, and have them potted for you at once. It will hurt them to remove them; but they will recover all that in a season. From these, picked up at all the places you can find, and of all the diversities of colour, save your seed, for by watering them in the pots until they die down, and then turning out the tubers, you will save them, however weakly they may be, and by planting them together in a bed in the way directed, they will in time recover, but if the flowers come small or imperfect the first year which is very likely, pick off the blooms at once, (as they would not do to seed from), and throw all the strength into the tubers. It may be that in this collection you get together some of the very best of the semi-double or *Ranunculus* formed flowers, if so, preserve and save seed, from the best only, and if you have not a heart to throw away the inferior ones, but mean to grow them for their tubers, let the flowers of inferior ones be picked off daily that they may not impregnate your better ones. We are quite convinced that

when two or three rows of petals are found, more will be attainable, and that there is no limit to the number which may be in time produced up to the doubleness of the *Ranunculus*. The properties of this flower will be the subject of another paper, but in the mean time whether the desirable form be obtained or not with regard to multiplied petals, the double kinds which we call dishes full of florets must be round, broad, thick, and open flat. The florets must form half a globe in the centre, and the petals and the centre must be the same width, that is, the centre must be just as wide across as the petal is from the centre to the edge. Smoothness of edge and brilliancy of colour are essential, but we must leave this subject for the present.

The Anemone, notwithstanding all the before mentioned particulars for those who have the convenience, may be grown, and is grown, with very little trouble; we remember to have had a pinch of seed given to us (we wish we had such another), with a hint that it was good, but it was as late as May, we had hardly a spare place, but cleared a patch of seedling cabbage plants from some out of the way corner, dug and sowed the seed on it, merely raking it in and covering with a bass mat to keep off the violent heat of the sun, with shading and occasional watering, the young plants came up, and then we left them. In fact, we forgot them altogether. In the spring, the sight of an Anemone bloom reminded us of the fact, and there we saw our treasure choking with weeds, and starved from being so crowded. Green as they were, we removed them to a bed properly made up, planted them carefully six inches apart, and that was in the course of time a sight worth seeing, we never saw stronger and better plants, and when they were taken up the tubers were as fine as the plants indicated. We have had a collection of the named Dutch flowers of modern date, and treated them with all the delicacy recommended by the dealer, but there is nothing more required than the treatment recommended in the foregoing paper, but that the double ones are less hardy than the single ones, we are quite certain; we do not mean that they will bear less cold, for that point we have not settled, but that they are easier damaged by wet or drought, or drying winds, much however is accomplished by attention to the good drainage of the bed, waterings at proper times, and stirring the earth about the surface, closing it about the tubers when they have by swelling and growing disturbed it, and made it all hollow and spongy, this is absolutely necessary, for otherwise there are vacuums which encourage vermin, and they are often damaged by being eaten away in the essential parts, that is the fibres and the part of the tuber wherever

the fibres come out. We do not recommend carelessness in the sowing of seeds, but people who have not the convenience for doing every thing as well as Obadiah Lowe, must not be deterred from sowing seed, for we will engage that if they only sow it, and rake it well in, and take care that it is not burned up for want of a shade and some moisture, they will come up well and arrive at maturity, nevertheless keep to the proper directions as well as circumstances will permit, and the reward will be quite equal to the pains you take. The collections of Dutch Anemones may be had of all the respectable London seedsmen, but such shops as Lockarts, Hurst and Mc Mullins, Batts, Charlwoods, Wrenches, Adams's, Warners, &c., import them every year in large quantities, and you may have scores that have been named by the Florists; Messrs. Lucombe and Pinee, at Exeter, used to cultivate the double named varieties with great success, and from them we had ours.

#### NOTES AND COMMENTS.

**ROOT PRUNING.**—A fox, 'says the fable, having lost his tail, persuaded his companions that tails were useless, and thus it was that bobtails came in fashion. Something of this, sort must have happened to the early Pine-growers or they never could have fallen upon the strange plan of cutting off its roots to make the Pine-apple grow. The preservation of roots was found difficult with the old and inefficient modes of obtaining bottom heat; and therefore roots were voted useless. Cut off all roots that are not fresh and healthy, says speechly; away with straggling roots, writes Nicol; disroot, disroot, cry half a dozen more for roots, are only annual things, and of no use to Pines after they are a few months old. Even Baldwin, with all his skill, could not perceive the error of the practice, although he confined his disrooting to the time when his succession were taken out of the tan and transferred to pots; and Mr. Glendinning, a still better authority, speaks of disrooting as a beneficial practice; adding, however, that it suits Queens better than the black sorts. There was, however, an exception to this singular practice, in the person of Griffin, the gardener to Mr. Samuel Smith, of Woodhall, who never would allow healthy Pines to be disrooted at any time, and who beat all his contemporaries in the magnificence of his fruit, although he was some way behind the Bicton and Longleat Pine-growers of the present day. We should be greatly puzzled to find a reason for the practice of cutting off the roots of the Pine-apple.

[This is from the *Gardeners' Chronicle*,

which is somewhat changeable. The fox deficient of his tail is a very unfortunate illustration, because a man could drop his practice of disrooting without any one being the wiser, there would be no possible object in persuading others to disroot their Pines. The simple fact is, that root pruning to hasten fruit bearing has been strongly recommended in the *same paper* for Pear trees, and the effect is exactly the same on Pines, nobody disroots with a view to grow large fruit; they do it to hasten fruiting; and it has the effect, which the people who do it wish it to have, and what more is required? The reason for cutting off the roots of the Pine is therefore obvious.]

**DOUBLE WHITE HEPATICA.**—In a late number it is stated that you are unacquainted with any Double White Hepatica. Being misled by Martyn's edition of the "*Gardener's Dictionary*," I, for several years, endeavoured in vain to procure a specimen of it. I have, however, the certain evidence of a friend, that a pot of the double white, some years ago, was exhibited at a flower-shop in Bath, which the owner refused to sell for any money, alleging that he had never seen another; and in answer to some subsequent applications for a specimen, the gardener said that the plants had died without his being able to increase it. In Martyn's edition, above referred to, the double white is represented to be equally common with the double blue and double red Hepatica, and the error is continued in Rees' Cyclopædia; but no such mention of the double white variety is made in either of the original editions of the dictionary, and the following interesting suggestion of Miller's has been entirely omitted by Martyn:—"I have sometimes known the double blue sort produce some flowers in autumn, which were inclining to white, and thereby some people have been deceived, who have procured the roots at that season and planted them in their garden; but the spring following their flowers were blue as before, and this is what frequently happens when the autumn is so mild as to cause them to flower; but whether the double white sort, mentioned in the books was only this accidental alteration in the colour of the flower I cannot say, though it seems very probable it was, since I never could hear of any person who ever saw the double white sort flower in the spring."—*Chronicle*.

[There is no more doubt about there having been a double white Hepatica, than there is about the double blue and pink, but that it is both scarce and miffy, or tender, is certain. Any one who could mistake the sickly autumnal blooms of the blue for a white, as suggested by Miller, must be demented. Martyn was perfectly right in omitting the suggested, the

Chronicle seems to have taken up the subject in the spirit of contradiction, because in our article on the Hepatica, and the subsequent letter of a correspondent, the existence of the white is insisted on.]

**CELERY.**—I am induced to recommend a mode of cultivating this valuable esculent, which I practised last season with the most complete success. My gardener having mentioned that his supply of Celery-plants had run short of the expected demand on him, I told him to go to a marsh in his neighbourhood, on the banks of the river Lee, where the tide flows over at high water, and that he would find abundance of plants ready for his use, both of the red and white kinds, and to make trial of them. He looked astonished at my proposal, but seeing that I was in earnest and willing to take on myself the responsibility in the event of failure, he did as he was directed, and is now ready to confess that he never cultivated a better crop than the product of these wild plants, as he called them.—*Gardeners' Chronicle*.

[The Bailey Nichol Jarvie suggests the answer to this system of gardening, "prodigious," we might as well say, that the crab apple grown in a garden was as fine a ribstone pippen, some palates are easily pleased.]

**SEEDLINGS.**—I have noticed that young plants in the seed-leaf, if deprived of their root and replanted, plunging them up the cotyledons, and pressing the earth, which must be very fine, carefully up to the tender stem, will again strike root and flourish. This may be useful in the case of valuable plants, one only germinating perhaps out of the lot, and that damping or having been eaten off by insects close to the surface of the earth. It was first noticed in the case of a Balsam, afterwards with Anagallis and others. The fact may not be new, but is, at all events, worth knowing at this time of the year.—*Micklewell.*—*Ibid.*

[This is worth knowing if true, but we doubt its general application, and shall try it with many things, we expect the only place to insert roots is the base of the seed leaf, and if so the stem below it is useless.]

**FERTILIZATION.**—Many Azalias have been fertilized with pollen kept for 6 weeks; that of Camellias has been employed successfully after having been kept 65 days. Fertile seeds of Lilies have been obtained from the application of pollen which had been saved 48 days. During the last flowering season of Camellias, M. Haquin collected pollen with which he intends hybridizing in the ensuing year. The following are some details of his procedure. The stamens are taken out just before their anthers begin to open; they are immediately wrapt in sized paper, and laid in a warm place for 24 hours, by which time the pollen separates from

the stamens. It is then collected and enclosed in thin sheet-lead, and kept in a cool, dry place. I think the preservation would be rendered more perfect by placing the pollen between two concave glasses, as is done with vaccine matter. No limits can be assigned to the time during which pollen will retain its fertilizing power, provided the minute globules of which its masses are composed are not crushed by too great pressure. If there be a limit, it will be for experiment to ascertain.—*Revue Horticole*.

[This is the most important of all the recent discoveries, for we have known some of our best practical horticulturists take immense pains to force one plant and retard another under an impression that both pollen and pistil should be ready at the same time, but if this be correct, and pollen can be kept two months, or time to bring pollen from the East Indies to fertilize hardy plants here.]

**CULTIVATION OF PEPPER.**—Among the various productions of the southern districts of Malabar, is the pepper vine; it is a staple commodity at Anjengo, and grows on a beautiful vine, which, incapable of supporting itself, entwines round poles prepared for it; or, as is more common in the Travancore plantations, the pepper vines are planted near mango, and other trees of straight, high stems; which being stripped of the lower branches, the vine embraces the trunk, covering it with elegant festoons and rich branches of fruit, in the picturesque style of the Campagna Felice. The mango and jac trees are generally used for this purpose; few pepper gardens contain more than eight or ten trees. The vines are planted near the trunk, and led to it while young; the stem is tough, knotty, and strong. Some begin to bear in the fourth year, others not till the sixth; they are in perfection about the ninth or tenth year, and continue bearing as many years longer, if in a congenial soil; from that period the vine gradually decays, and a new soil is then prepared for a considerable depth round the tree, for the reception of fresh shoots from flourishing vines. The leaf of the pepper plant is large, and of a bright green; the blossoms appear in June, soon after the commencement of the rains. They are small, of a greenish-white; succeeded by bunches of green berries, which turn brown and hard as they ripen; the pepper is gathered in February, and has the same appearance as when sent to Europe. The flavour of pepper is more or less communicated to the fruit of the tree which supports it; a circumstance not at all relished by the proprietor, as many mangoes naturally taste strong of turpentine, and are not improved by the additional pungency of pepper. Assiduity and cleanliness are essen-

tially necessary in a pepper garden; not a weed is permitted to grow; the produce, however, amply compensates for the trouble; for although the Anjengo pepper is not so much esteemed as that produced at Onore and Carwar, it is sold, on an average, at eighty rupees a candy; five hundred and sixty pounds English weight. It is treason to destroy a pepper vine in Travancore, where the king monopolizes that branch of commerce; but permits the merchants of Anjengo to have a free trade with his subjects in cassia, coir, cables, and cordage, made from the outer husk of the cocoa-nut.—*Forbes's Oriental Memoirs*.

[There is hardly any thing in the appearance of pepper to lead us to suppose it was grown on a vine, and as to its being a small green berry dried, and not as it first appears a seed, few would have formed any such idea. The berry of tea is by no means unlike that of the pepper, yet this is borne on a shrub like a Camellia, of which indeed it is a species, and as unlike a vine as possible, unless, therefore, a person be botanically acquainted pretty much with plants, the seed is very little guide to him in forming a proper estimate of the tree, shrub, or vine which bears it.]

**BLACKING WALLS FOR FRUIT TREES.**—I do not approve of the plan adopted in different places of painting or coating over the wall with a composition of black, because, in so doing, it closes up the porous texture of the bricks, and prevents the heat from penetrating into the wall so much as one of common brick; thermometers, placed against the wall, with the same situation and aspect, the one against the wall painted black, will be found to be four or five degrees lower than the other against the common brick. An idea has occurred to me, that if the bricks, before they are burned, were to be dipped in a *liquid of black*, that the bricks would retain their open texture, and allow them to draw in the heated air to a much greater degree than the common brick. The expense of dipping one side would be trifling. Brickmakers, I should think, would know of some cheap ingredient that would answer the purpose.—*Correspondent*.

[We do not like black walls well enough to seek a mode of colouring them, we have given a vine a fair chance, because we made half the wall black and half was left plain, we found that although the black wall absorbed most heat, it reflected least, and a glass laid on the ground in front of the plain wall was higher than one placed opposite the black wall. Thus it would seem that both the upper part of the plant and the roots on the earth had less instead of more heat from the black wall; our Correspondent is wrong, as the cause of the glass being lower, he would probably have

found it higher at the back of the black wall than at the back of the plain one. The mistake, perhaps, that theorists made, was in calculating the effect by the heat which a black wall absorbs, instead of the heat it gives off, for it is that which a wall gives off that benefits the plant, not that which it absorbs, and these are not always alike].

**NATIONAL GARDENS.**—We pray the members of both houses to turn out some fine morning and look through the plantations of St. James's Park, and ask themselves whether they would keep in their employ one hour, a gardener who would be directly or indirectly concerned in getting together, without order, without arrangement, without taste, such a jumble of common, ill-grown, ill-planted, ill-conditioned things, as may be found hurdled off in that space of ground. The very best views of the Palace are shut out; the most beautiful features of the landscape destroyed; the very island seems to have been let off to the Commissioners of the road as a stone-yard, where their heaps, like those on the side of the highway, disfigure the whole margin of the lake. We call this suggestion the first; but let it not be tortured into idle grumbling. It is a blot on our national character for Landscape Gardening to permit such despicable deformity under the very windows of the Palace wherein all is taste. It is a melancholy monument of parsimony and ignorance, and the sooner it is desecrated the better. The capacity of that park is enormous; that spot of all others near the Metropolis, possesses capabilities to be hardly found elsewhere, yet all in the place is hideous deformity; all in the selection is not only common, but bad; all in the execution is unworthy a worker on the roads.—*Gardeners' Gazette*.

[The *Gazette* has been rather notorious for taking up subjects of this kind. It is rather in the tone of a paper in our own work, but serves to show that we are not far wrong in our notions of that national blunder. It is a question, whether this do not lead as in the case of Kew Gardens, to an inquiry. There is in fact no excuse for making our gardens the laughing stock of even the men employed in them.]

**VARIETY OF PLANTS GROWING ON THE RUINS OF THE COLISEUM AT ROME.**—In the interior of the Coliseum the destruction is more complete: the marble seats are all torn away; the steps and the vomitories overthrown; and the sloping walls and broken arches, which once supported them, are now overgrown with every wild and melancholy weed, waving in all the luxuriance of desolation. So great is the variety of plants that have rooted themselves in these ancient walls, that Sebastiani, the professor of botany at Rome, has publish-



ed a work in quarto, entitled "Flora Coliseo," in which two hundred and sixty different kinds are enumerated, as growing on the walls of the Coliseum. But this does not nearly include all, which, with the various sorts of mosses and lichens, amount to upwards of three hundred species. Nearly one quarter of these are papilionaceous, and there are three species of hyacinth; one very beautiful, peculiar to the vicinity of Rome. The remainder of the plants of the Coliseum are chiefly such as are found on old walls in the south of Europe.—*Rome in the Nineteenth Century.*

[It would be a curious task to speculate on the various modes in which the different seeds were conveyed to this curious locality, though there are three which are tolerably active agents. Birds who carry seeds and deposit them in their excrements; water which takes up many things which afterwards descend in rain; and wind which drives seeds of all kinds wonderful heights and distances.]

**GRAFTING THE LILAC ON THE ASH.**—This season I grafted the different species of Lilac upon the common Ash, in accordance with some information I received from a friend (Mr. Wolff, jun.,) while I lived in Paris. I do not recollect to have seen any account of any one having tried the same in this country. We had grafted here about three dozen ashes, varying from 4ft. to 10ft. in height with the common and Persian Lilac; and I am happy to say that the result has exceeded my most sanguine expectations; for we have now growing about twenty fine healthy plants, with branches from 1ft. to 18in. long, which I hope in another year, to see covered with bloom. They were grafted in April, after the Lilacs had made considerable shoots. I would therefore advise that the scions be taken off in January or February, in order to retard their vegetating too soon for the stocks. Would not the pendulous Ash form a beautiful object by having its branches grafted with Persian Lilac?—*J. Scott's Gardener's Magazine.*

[We should think not; how an upright growing shrub would become a beautiful object by being grafted on a drooping tree we are at a loss to know. If it grew at all, it must be upwards again, and nothing but confusion could follow. We should like to hear the progress of the Lilac up to the present time.]

**CORRÆA LONGIFLORA.**—The history of this beautiful variety is the same as all the rest. Mr. Milner raised a number of seedlings, and this among them. They were thought nothing of by the nurserymen to whom they were shown, or rather they affected to think nothing of them. Mr. Glenny fancied he had seen large prices paid for much worse plants, and

took the whole. This very pretty variety is one of them, purchased by Messrs. Lucumbe, Pince, and Co. Mr. Groom's two varieties are from the same source. Mr. Buchanan's *Grandiflora*, and Mr. Low's *Cordata*, are from the same stud; and there are three or four more varieties, equally distinct, equally beautiful, not yet published to the world. The sole object of this paper is, however, to do justice to the raiser, Mr. Milner, a member of the Metropolitan Society, where the first seedling that bloomed was first shown. The only variety likely to come to any great eminence, or to bear any large price, that was not raised by Mr. Milner, is *C. bicolor*, the flowers of which are not longer than *Alba*, the colour being half bright rose and half light green, after the manner of *Speciosa*, though different in the shades of colour and in the form of the flower. The foliage is bright and rough, and the plant handsome, even when out of flower. Except this one, we know of no new *Corræ*, but those raised by Mr. Milner. We have already observed how differently a plant is estimated, according to the circumstances in which it is placed. This very beautiful variety, noticed by Mr. Paxton, has been exhibited at Regent Street, without eliciting the slightest complimentary notice; whilst rubbish, without the slightest claim, has been highly honoured.—*Correspondent.*

[Florists ought to set their faces altogether against any names purely botanical, because the first professor that may come across a new variety, will very naturally honour it with a botanical name as nearly descriptive as may be. The one raised by Mr. Glenny was called *bicolor*, because being of two very distinct colours, it could hardly be botanically named better, but Mr. Law, of Clapton, bought it for £65; and a worthless variety of dirty whites and dirty reds, shaded from the one to the other, was called *bicolor*, and had the benefit of the publicity given to the original, but took everybody in. It was not worth growing as compared with the meanest of the known varieties. What has become of the true *bicolor* we know not, but it was a pretty plant, with handsome foliage, a small bright bloom, perfectly distinct from all others.]

**FORCING THE VIOLET.**—In the month of May I take off the runners from old plants and plant them out in beds on a south border, keeping the ground well hoed, and occasionally watering them in dry weather during the summer. In October I take an old cucumber or melon-bed for a three-light frame, and plant them in a compost of one part vegetable mould and the other rich loam, with a little sand; care must be taken in moving the plants to have good balls adhering to them, otherwise

they will not bloom near so well. Let them have abundance of air every day, and protect from frost at night, taking care to pinch off the runners as they appear, as this makes them bloom freer and stronger. Towards the end of November I commence putting linings of hot dung and leaves, but never let the heat rise above 60 deg. during the night, otherwise it will spoil them entirely (as they are very impatient of heat;) by this method they will be beautifully in bloom by Christmas, and continue flowering till May, when they may be planted out to take off runners for the following season.—*Gardeners' Gazette*.

[There is hardly a more beautiful flower in all respects than the violet, particularly the large dark double, and the Neapolitan, which is a pale blue. The above is furnished by a correspondent who is very successful; and though it does not differ materially from doctrines already given, is worth a place.]

THE DOMESTICATION OF VEGETABLES.—M. Villmorin, of Paris, pursues the following mode of improving the culture of the wild carrot. In 1832 he first sowed some dry seed in soft and deep earth, and in another soil in 1833, but both ran to flower and seed. In 1835 he planted some of the roots of the preceding year, when he found that the plants had undergone a remarkable change. This third generation from the first was good and fleshy, and in 1836 many of them were edible. The red colour appeared in the third generation, and the seed from these almost uniformly produced red carrots. It was found that the crops of March and April almost all ran to seed, whilst those of May and June did not; and it was from these later crops that the root from an annual was made a biennial plant.

[This is all very well as a work of curiosity to see how soon we may accomplish that again which was accomplished before, but it is unprofitable; there is no good to result from such things, because it is waste time. The same pains taken with what we have got might produce better. Besides, there is no credit now in producing the improved vegetable from the wild, because the world is almost sure to be impregnated with the improved sorts.]

TURNIPS OF GREAT SIZE.—In one field of three acres, I had hundreds of turnips (I might say thousands) varying in weight from *twenty to six and twenty pounds each*, and in one small piece of vetch ground, wanting twenty-nine yards of an acre, which I did not sow till the last day of July, I calculate that I had at least six and forty tons of turnips (white globe). It is true I had bestowed extraordinary labour on the ground. It was old—I had it trenched with the spade—sowed it with vetches which were eaten off by sheep, and then plenty of

good stable dung with good tilling bestowed on it previous to sowing the turnips, which I did with ashes. The crop, however, was wonderful, as *was also the size, beauty, and soundness of the turnip*.

[This paragraph is from the *Exeter Flying Post*, but we thought at first of simply leaving out the F, for we are quite sure the printer could not resist the temptation if we merely quoted it.]

LILIUM LANCIFOLIUM ALBUM, &c. — I have grown this in the open air for two years, and consider it quite hardy. Last season I had a bed containing about 150 flowering bulbs, which bloomed much better than the common kinds of Lilies; and had it not been for the unfavourable weather of last spring, they would have been excellent, but on this account were comparatively short; and some of the foliage and a few of the flowers were injured, but not so much so as the common Orange Lily. The bulbs lifted quite well both seasons, and did not lose a single root from frost. *L. Lancifolium punctatum*, I have not tried in the open air, but no doubt both that and Rubrum would do equally well. *L. Eximium* and *Longiflorum* are very much alike in general growth, and the treatment that would suit one will suit the other. They will grow and bloom well in the open air, but the foliage is sometimes damaged by wet and spring frosts; they appear to be earlier than *L. Lancifolium album*, and not quite so hardy; but this may arise from their coming above ground earlier in spring. The principal injury is done when the plants first begin to expand their foliage, occasioned by wet lodging between the leaves and becoming frozen, by which their vessels are ruptured, and disease is the consequence. This shows itself in brown blotches on the foliage. A light sandy peat mould is the best soil for these bulbs.—*H. Groom*.—*Gardeners' Chronicle*.

[Nobody has had more experience with this beautiful plant than Mr. Groom, and it is well worth knowing that a plant is hardy; we have seen an immense stock at Mr. Groom's, and in general they were in fine health; the lesson here given as to allowing water to accumulate in the heart of a plant and freeze there, is of consequence. It may be perfectly hardy and yet be damaged by frost in the young growth of the heart, for we have all seen, that some of the hardy trees, that have stood half a century, will have their young growth of the spring frequently damaged by frost; there are few plants present a more beautiful object than a fine specimen of *Lilium Lancifolium*.]

CHARCOAL.—Last year I potted two standard Hydrangeas in 16 sized pots, with two-thirds turfy loam, and one-third sifted char-

coal; the drainage, which was three inches deep, I formed of coarse pieces of charcoal: when the plants bloomed, I found the colour of the flowers to be a beautiful bright blue, and so they continued to flower the whole of the season. Every plant seems to delight in charcoal; since I have laid charcoal merely on the surface of the mould, round the stems of many of my large Orange and Lemon trees, the alteration has been very striking; the foliage assuming a dark rich hue, and the plants being altogether most luxuriant. It is my opinion that large beds of blue Hydrangeas might be easily obtained by the above treatment.—*J. L. Snow, Swinton Gardens.—Ibid.*

[If this be so, and Mr. Snow is an experienced gardener, there is an end to the apprehension which some felt that charcoal would be injurious mixed up with the soil in any quantity.]

**FLORISTS' SOCIETIES.**—The origin of Florist's Societies has been ascribed, by Sir J. E. Smith to Norwich, where a love of flowers, and a great degree of skill in their culture, was introduced with its worsted manufacture, about the middle of the sixteenth century. There are records that Florists' feasts were held there as early as 1637; a play called *Rhodon and Iris* being extant, which was performed before the company in that year. It is probable that the next sprang up in London, and Nathaniel Wrench, of Fulham, is said to be the first who established them; and a late author states that the Florists' feasts and meetings were at their greatest height in London between 1740 and 1770. One of the oldest and most flourishing was the Islington Floral Society, the meetings of which, at its formation, were held at the Barley-mow, an old and respectable public-house, situate in the parish of Islington, on the side of one of the old pack-horse roads leading from Blackwell-hall, in the city, to the north of England, now called Troy-lane. They were afterwards held at the Britannia tavern, where there exists a copy of their rules; from whence they removed to Canonbury-house, and subsequently to the King's Arms tavern, opposite the church. Here, after it had been in existence upwards of half a century, the Society was dissolved, the members merging into various others which then came into existence.—*Gardeners' Gazette.*

[Records of ancient date prove, or at least bear strong evidence that Bristol was the first to follow Norwich, for the beginning of the seventeenth century was about the period when shows were commenced there; indeed many parts of the country where manufactories flourished, were soon noted for Floriculture, and as we have shown on many occa-

sions the more humble class of artisans were the best florists.]

**THE EXAMINATION OF GARDENERS IN DENMARK.** BY A. WEILBACH.—An examination for gardeners has been established in Denmark since the year 1811, an account of which is given by Mr. Lindegaard, in the *Gardener's Magazine* for 1828, p. 76. This system of examination was in 1833 considerably altered, as will be seen by the following statement:—The examination is divided into two classes: I. for ordinary gardeners; and II. for artist-gardeners.

I. The examination for *ordinary gardeners* consists in:—

*A practical trial*, by which the gardener is required to show the necessary skill in the pruning and grafting of trees, the knowledge of seeds of culinary vegetables, and the quantity of each of these required to a certain piece of ground; and lastly, the knowledge of the common fruit and flowers. And

*A theoretical trial*, which is only verbal, and where the gardeners are required to understand:—

1. The laying out and managing of a common kitchen garden; under which are included the raising of seeds, the management of hotbeds, and the culture of melons.
2. The laying out and management of a stock ground and an orchard; under which is included the training of trees to walls.
3. The culture of the common ornamental plants in the open air, as well as in pots.

II. The examination for *artist gardeners*, which is a condition for being royal gardener, consists in:—

*A practical trial*, similar to the above-mentioned, but on a large scale.

*A theoretical trial in writing*, by which the gardeners have to answer six questions in the different branches of gardening, viz., three general and three special questions; and at the same time draw a sketch of the laying out of a given piece of ground. And

*A verbal theoretical trial*, by which the gardeners are required to show that they have—

1. A knowledge of the management and compositions of the soil.
2. A knowledge of botany, especially those parts of botany which are essential for a gardener to know.
3. Land-surveying, as far as it is necessary for a gardener.
4. The laying out and management of a kitchen garden on a larger scale than is required for an ordinary gardener.
5. The laying out and management of an extensive orchard; together with the knowledge of the different varieties of fruits.
6. The laying out and management of a large

flower-garden with rare flowers, which the gardener must know, and whose cultivation he must understand.

7. The management of a forcing-garden, consisting of fruits, culinary vegetables, and flowers: together with the construction of forcing-houses and pits.
8. The culture of hothouse and green-house plants, and the construction of such houses.
9. Everything required for the laying out of grounds on an extensive scale.
10. The management of a stock ground for fruit trees, and other trees and shrubs, on a large scale.

The gardeners are examined in the different divisions, in the same order as they are here enumerated; and if they do not succeed in the first or second trial, they will not be allowed to proceed to the following one, but be rejected. There are five examiners, viz., four royal gardeners, and the professor of botany. The questions and answers are put down in a book by a secretary, and are preserved together with the written answers.

The examination is public, and everybody is allowed to attend it. It takes place in the month of September; this time of the year being preferred as the most convenient for gardeners entering on situations.

These are the alterations made in the former system of examination; in other respects it is quite in the same manner as mentioned by M. Lindeguard, in the volume and page above quoted.

The above is given exactly as translated from the Danish by M. Weilbach, a most intelligent young Danish gardener, now in England for his improvement, and who came to us strongly recommended by the celebrated writer on botanical geography, Professor Schouw.

[Is not this a good model in which an association of experienced gardeners would like the city companies of old who formed regular corporations, found a regular course of examinations, instead of leaving a man's talent to develop itself when opportunity is offered which may not be before the best part of a man's life is lost in subordent situations ?

#### TULIP CATALOGUES.

THE readers of this work will recollect that we have more than once referred to a descriptive catalogue of Tulips, published by a grower in the north, who had according to our notion overstepped all bounds in his descriptions, and proclaimed that, which one of our contributors considered to be perfectly erroneous. It will be remembered, too, that our con-

tributor on that occasion, feeling that the author had stepped out of his way to say that which was untrue respecting the party who opposed him, was greeted with one of those hard hitting articles, which any one who meddles carelessly with the writer is sure to bring down upon himself. There has now been abundant time to cool upon all this, and the Tulip bloom has given us an opportunity of comparing the descriptive catalogue, and the objections to it with the flowers themselves. The result is, that in no one instance was our contributor in error, while the complaints against the catalogue were substantiated; the grand fall-out was about Polyphemus and Albion, both of which are the same flower, and the descriptive catalogue made Polyphemus a dirty flower, while Albion was lauded to the skies. We do not like personal squabble, but our contributor, who felt he was right, and whose article opened the eyes of those who fancied the catalogue would be a guide, complained both of the catalogue-maker, and the editor of the work in which it appeared, for not confining their remarks as he did, to the subject upon which they were at issue. However, the personalities were noticed, no further than by a flat contradiction, and the matter rested until the author of the catalogue visited Mr. Lawrence's collection, where the flower Polyphemus and Albion was "broke," and there learned that our contributor was right, and that he was in error. This we announced at the time, and left the matter at rest. The catalogue is again announced, and with it Mr. Glenny's opinion as Editor of the *Gardeners' Gazette*, and however much the author may be convinced of its correctness, we think he has most strangely mistaken the weight of Mr. Glenny's opinion; we believe there are few men whose writings are more generally depended upon by florists.

#### HINTS FOR THE MANAGEMENT OF BEES UPON THE DEPRIVING SYSTEM.

*January.*—Should the cold be intense, no operation whatever should be performed on the bees that requires the removal of the hives. If snow be on the ground keep the perforated sliders\* (page 18), closely down that air may be admitted, but not a bee allowed to escape until it be thawed; but immediately upon the disappearance of the snow remove the slider, and give them full liberty. I have known many stocks lost by not attending to this precaution, and more especially after a long confinement. Do not suffer the snow to melt

\* This is a contrivance in some of the new hives to keep the bees in the hive, without depriving them of air.

either upon the covers or hive-boards, but brush it off every day as it falls. Attend regularly to the condenser (page 90), which to boxes with flat roofs is a very necessary and useful appendage.

*February.*—Upon a mild day in this month let the floor board of each hive be cleaned, and a little food administered, should the stock of honey be very low. See that the coverings be sound, and that no moisture comes upon the top of the hives. Should it be found that any of the hives have perished, which will sometimes occur, and from causes which cannot be exactly ascertained, let them be immediately removed, and the honey which they contain taken out, and reserved for feeding those that may require it.

*March.*—Clean the hive-boards again, and should any of the stocks require feeding supply them, attending strictly to the directions given in chapter 9. Towards the end of this month place a vessel, containing water, near the bees, as directed in page 3. This also will be found a good time to examine the pedestals upon which the hives stand, for after remaining some years in the ground they are subject to decay at a few inches below its surface, especially if regard was not paid to the quality of the timber at the time of fixing them.

*April.*—Clean the hive-boards for the last time, and supply food, if required, as before directed. The wax-moth, that redoubtable enemy to bees, appears this month; they may be seen frequently at twilight running upon the outside of the hives; destroy them as much as possible, and, as Huish says, "frighten not away the bats that fly about the hives, for they destroy numbers of them." A full supply of small hives, boxes, glasses, and adapters should now be provided, old ones cleaned, or new ones purchased. A few large hives also should be ready, for, if from inattention to giving room and ventilation, a swarm should be compelled to leave their hive, they will be wanted.

Weak hives are now very subject to an attack from robbers; the best protection that can be afforded them is the slider, page 18, with the help of which three or four bees will guard the entrance more effectually than many times that number without it.

*May.*—The time will now have arrived for supplying each stock with a small hive or other receptacle for honey, as directed in chap. 4, and should the season be a favourable one, the supply even of a second may be found necessary before the end of the month. Continue to destroy queen wasps and hornets, and to watch carefully for moths. Should the bees of any hive appear inactive at this time, or should they not be seen to carry in pellets of farina

whilst others are doing it, and this inaction continue for eight or ten days, lose no time in examining the hive, and should the moths have begun their work of destruction, which may be known by seeing the combs joined together by their silken webs, cut away the comb affected with a sharp knife, and the hive may, perhaps, be saved.

*June.*—Strict attention should now be paid to room and ventilation, for, as has been said in page 24, if both these be carefully observed, swarming may be prevented altogether. Swarms may now be purchased as directed in chap. 2. About the middle of the month, in good seasons, small hives and glasses may be taken off, full directions for which may be found in chap. 5.

At the end of the month look for wasps' nests, and destroy them; a very easy and effectual method of doing it is to fill a common squib or serpent case with a mixture of sulphur and gunpowder, in equal parts, with a very small quantity of nitre, all finely powdered and rammed very hard into the case, set fire to it by means of touch-paper, and when in a state of ignition, stick it into the hole of the nest, and place your foot upon it; when it ceases to burn let a person with a spade turn out the nest; in this manner a great number may be effectually destroyed in one night.

*July.*—Small hives and glasses must now be taken off as they are filled and sealed up (and stored in cool places, observing to keep them in the same position as when standing upon the stocks), and their places supplied by empty ones. Go on destroying wasps' nests.

*August.*—Continue to take off hives and glasses as they are filled, but supply no fresh ones, the honey season being now chiefly over.

*September.*—Small hives remaining upon the stock that are only partially filled with honey may now be taken off, providing the stock will not be too much impoverished thereby; wherever the chance of this presents itself leave them on through the winter, or until they are emptied by the bees; those partially filled hives taken from rich stocks may be given to weak ones, now, or in the spring, as required. Robbers will at this time be carrying on their depredations, and should a serious attack be observed, the sliders must be used as before directed.

*October.*—Examine the coverings to the hives that they be all sound, and that no rain be admitted through them. The entrances may now be narrowed, if Taylor's slider be used (page 18); the slide with three openings will be most proper for this season.

*November.*—Clean the floor-boards of the hives, and see that they stand firmly on their

pedestals; contract the entrance so that only one bee can come out at a time, for at this season mice are likely to lodge themselves in the hives.

*December.*—The same attentions are necessary this month as in the two preceding; but if the cold should be intense the hives must not be removed.

[The foregoing is abstracted from the *Apiarian's Guide*, and will be found useful to any who have the most limited experience in the care of these busy providers.]

#### THE PLEASURES OF GARDENING.

GARDENING is almost, perhaps quite, the only occupation in which the peasant can indulge with the same enjoyment as the prince. There is no other fancy to which there is not a limit drawn by a man's circumstances. Let a poor man be fond of pictures, it is beyond his means of indulgence; let him admire sculpture, he could not with a year's wages buy a single statue; suppose him to be inclined to conchology, he would be unable to own the shells that a rich man would throw away. Imagine him an astrologer, he could not buy a telescope: if he had a fancy for old coins, his seven years' income would hardly purchase an old crown piece; we could mention fifty arts and sciences in which the poor man could scarcely enter, but, in gardening with a single rod of ground he could beat, or at least equal a peer of the realm. Therefore, is gardening the most general, nay, it is a universal science. The cottager with his pennyworth of seed may produce whatever he grows quite as good as my lord produces his; and we are more proud of our little book which the cottager reads and leaves to his children as a legacy than we could have been, had we made the best book that ever was written upon any other science in the world. Gardening is the only recreation in which the man of limited means may equal the owner of a thousand acres, for however small his garden, he may exult in whatever he can grow, and his pleasure is as complete in growing his productions as that of the nobleman for whom he may work as a labourer. The cottagers of Norwich and Norfolk invariably beat the gentry at the Horticultural shows in all the useful vegetables, and hardy fruits, and the gentry find their account in encouraging the honest pride in which their humble dependents indulge, nor are these lowly aspirants to gardening fame altogether confined to vegetables; they have their flowers as well as other subjects, and being allowed to compete with each other, many a nosegay which for taste as well as choice of flowers would be worthy of a first-rate garden, may be seen to

grace the cottager's tables. Gardening offers so many subjects for a man's attention, that he need not take up that which his neighbour already does in perfection. One man may excel in carrots, another in cabbages, a third in onions, a fourth in salads, and a fifth in potatoes; in short, besides emulating those who do the best of a thing, he may take up some subject to make particularly his study. He may be independent of his neighbours, and yet excel in something that nobody else had attempted before him, and who shall say that the poor man's enjoyment in his garden, among his pet flowers and useful vegetables, is not as great as the peer's among his pictures, coins, shells, or statues, or the miser's among his gold? The very labour in his garden is sweet, no matter whether he has been broiling in the sun all day, or stewing in a manufactory, he will set to work in his own garden in the cool of the evening, as if change of work and change of scene were a holiday; all he does there is for himself; and oh! that we could be Queen, Lords, and Commons, for forty-eight hours, we would suspend the standing orders, and pass an act against building another house in any part of the country with less than a quarter of an acre of land to it. Some of the millions of acres of waste land would soon be studded with cottages, the labouring classes would soon be independent of unions, gardening would take the place of drinking and gaming, plenty would reign where squalled poverty is triumphant, simply because a man's waste hours would be profitably employed, and instead of occupying them as now in spending money, he would then be earning it. No man begins gardening without becoming fond of it; he never looks at his work in his own plot of ground as labour. If he laboured at gardening all day for his employer, he would begin for himself with renovated spirits, and call it pleasure; and why, because for every hour we give a garden dame nature gives us two. We do not find a garden as we leave it; set to building a pig's sty, and you have to lay every brick, it grows only while under your own hand—as you leave it Monday morning, so you find it Saturday night; not so your garden—it is a piece of machinery, which, when you set it to its work, keeps going in your absence, and gratefully, or rather we should say kindly, works night and day in your service; all you have to do is to feed the machine. Who then would not be a gardener?

#### THE ROYAL BOTANICAL SOCIETY'S WINTER GARDEN.

CONSIDERABLE interest is always excited by the model of the society's proposed winter garden, and many do not understand what is intended.

The model is like a succession of greenhouses stuck together, but it is only the great extent of the design which puzzles people a little. Mr. Marnock, at an early period, gave his ideas upon the subject, and as we have seen no recantation since he was appointed curator, it is worth minding. It will be observed that it was given before the society began the laying out of the garden.

"As the Council of the Royal Botanic Society of London expect shortly to proceed with the formation of their garden, we avail ourselves of the present opportunity of throwing out the following ideas relative to the structures which it may be thought desirable to raise for the cultivation of such exotic plants as require the protection of stoves and greenhouses. In gardens where the professed object is the cultivation of a general collection of plants, stoves and greenhouses are indispensable; but these are only an end to a means; and were it possible to cultivate the same plants with equal success without the aid of glass, no one would for a moment think of incurring the expense of raising such buildings. In some form or other, glass is, however, indispensable, and ingenuity and practical skill have done much to render these at the same time useful and ornamental; but in order to carry out the latter, it is no unusual case to expend thrice the amount that would otherwise have been required to effect the same object. With these remarks we shall endeavour to explain the ideas to which we refer. In attempting to do this, we may observe, that instead of erecting, at great expense, ornamental buildings as conservatories and stoves, we would suggest that a portion of ground should be covered with glass. The surface of this ground should be varied, some parts rising to a considerable height; others depressed, and forming valleys with water; and the glass roofs should be made to follow, in some instances, the inclination of the ground; so that those kinds of plants which require a greater degree of light might be thus accommodated. Other parts of the roof should be preserved at a greater elevation, in order to afford space for the loftier kinds, such as many Australian and tropical plants. For the greater convenience of cultivation, divisions might be formed within this structure, yet so as not to be perceptible. Platforms in various parts might also be formed in near connexion with the glass, for the cultivation of tender and delicate-foliaged plants, whilst those of more robust habit with fleshy foliage would occupy situations where the light was less intense. Rocks and precipices for the cultivation of succulent plants might also be constructed, whilst the tropical Orchidea would occupy banks and trunks of trees in their respective situations

and temperatures. Throughout the whole of the anterior, except in a few instances, none of the plants should be seen growing in pots, but should either be planted out in the free soil, or plunged so as to conceal the pots. The surface of the ground should be covered with lycopodium, ferns, mosses, and similar plants, which delight to grow in the shade of others. In order to afford access to examine and inspect the plants, gravel walks should be formed, winding in various directions throughout the whole of the interior. The principal supports of the glass roof should stand in connexion with each other, and be covered with earth or other material to a considerable height, so as to present the appearance of an elevated ridge, with the foliage of the shrubs growing on the highest parts of these ridges, or knolls, and concealing the upper portions of the pillars. The mode of heating and other details need not be entered upon here. At some distance from the exterior boundary, the ground should be elevated and planted, but not as in any way to obstruct the rays of the sun from falling upon the roof and upright portions of the glass, but as far as possible to conceal it from the view of the surrounding ground. Mr. Paxton's ridge and furrow roof is admirably adapted for this style of building. The entrance to this plant structure should be made to pass through winding banks, so that the visitor may be led imperceptibly from the open air to the interior, and at once find himself in the midst of a mimosa grove, or some other natural group of plants. On the practicability of carrying out such an arrangement as this, we are willing to stake all our professional experience, both with respect to the erection itself, and also the cultivation of the plants."

Now the model exhibited is an immense thing, and in the interior, we observe Mr. Marnock's notions in most particulars carried out, so that it is fair to presume, that so far as we have hitherto gone, there has been nothing to contradict or subvert the above notions of Mr. Marnock. No one ought to attend the gardens without particularly observing this model of the winter garden, which is in a shed by itself, but is always open to the visitors.

#### A TREATISE ON INSECTS INJURIOUS TO GARDENERS.

BY VINCENT KOLLAR,

*Curator of the Royal Cabinet of Natural History at Vienna.*

[Translated from the German, and illustrated by engravings, by J. and M. Loudon. With notes by G. O. Westwood, Esq., F.L.S., &c., Secretary to the Entomological Society, London. 8vo., 1840, p. 377.]

Two great objects are effected by this book, which has been ably translated by the Misses

London, sisters to the celebrated Mr. Loudon; and, as the history and economy of each insect is given, we shall be the better enabled to combat them, and prevent future injury. The task of a translator is generally a thankless one, but in the present instance we have an exception, for this book will, we have no doubt, be gratefully received by all agriculturists, foresters, and gardeners: it being written in a clear and elegant style, capable of being understood by all, and, as it is without those technicalities which are so frequently found in books of this kind, will, no doubt, encourage many to study entomology who were afraid to do so before. The history of every insect is given from personal observation, from the egg-state, through all their changes, to the imago or perfect state, and "their relation to vegetable productions explained as far as possible." As an example of the accuracy and fulness of the descriptions, we will quote the article on—

"THE RED GRUB OF THE PLUM.—*Tortrix (Carpocapsa) nigricana*, Schmidt." "The red plum caterpillar (*Tortrix Nigricana*) is not so much to be dreaded as the copper weevil (*Rhynchites cuprens*) and the saw fly; but is, however, very injurious to the different sorts of plums, particularly the early and house plums, which are often rendered disgusting by the little red worm found in them. This worm does not produce a beetle, but a moth, not so large as a house fly. Its fore wings are black, changing to a metallic hue in the sun. On the outer edge of the fore wings, and reaching tolerably far up, there is the appearance of fine silver dust. The black spot on the extreme point of the fore wings is surrounded with a white border, and has the appearance of an eye. This moth appears in the beginning of June, but it is difficult to be distinguished on the plum-trees, on account of its dark colour. It is still more difficult to catch these insects, as they are easily frightened. Their eggs, which they lay on the plums, are hatched when the weather becomes warm. In July the grub penetrates deeply into the plum, and the outward wound which it made in entering soon heals up. Richly fed, and protected from rain and wind, the little caterpillar arrives at maturity while the plum continues to grow and ripen. Instead, however, of sweet pulp, the plum, when gathered, is found filled with the excrement of the caterpillar, which it never gives itself the trouble to endeavour to clean out, and the fruit generally falls off before the grub has left. As soon as the caterpillar has attained its full size, it creeps out of the plum in search of a place to spin in, and when it meets with a loose or splintered piece of bark on a plum, or other adjacent tree, it insinuates

itself between the bark and the wood, or penetrates as deeply as possible into the chinks of the former, where it encloses itself in a case before going into the pupa state. This takes place in spring, and the pupa is of a light brown colour. The moth generally comes out before the end of May, and begins immediately to propagate its species. It appears, from the history of this insect, that but few means are in our power to diminish its numbers. Our first endeavour must be to get the plum-tree grub from the tree as soon as possible. If we see, for instance, that a plum begins to ripen before its usual time, we should shake the tree to make that plum fall, and immediately convey it out of the garden. The shaking of the tree must be continued several days; because there may be plums containing caterpillars that are not sufficiently ripe to fall at the first shaking, though these plums may always appear to ripen much sooner than the others, as the severe wound which the plum has received brings on a premature ripening. The fallen grub-eaten plums should all be picked up immediately, because the caterpillar does not long remain in the fruit lying on the ground, as it has in general attained its utmost size before the fruit falls. The plums, however, need not be thrown away, but may be distilled for brandy. Those who possess a great many orchards of plum-trees will certainly find it worth while to pick out the grub-eaten plums from the rest, in order to destroy the grubs; and whenever there is an abundant crop, there are always a great many plums attacked by these caterpillars. It would contribute in some degree to lessen these insects if, in spring, the loose or split bark were taken off the trees, as the caterpillar is generally found lying under it, or in it, as we have already mentioned; and after a good plum harvest cocoons are always found in such situations."

There are a great number of accurate and well-engraved woodcuts of many of the species in all their states, many of them executed by the translators, and no person engaged or interested in horticulture, or agriculture, should be without it.\*

#### THE GARDENERS' BENEVOLENT SOCIETY, AND ITS FIRST PUBLIC SHOW.

It has been always a subject of regret that the gardeners themselves have been the least active of the friends of this institution, and it has been said, with too much truth we fear, that the gardeners' means, take them as a body, are too limited to enable them to spare much for the future on account of the press-

\* The work was well received in 1840, but it can lose none of its value by the mere lapse of time.



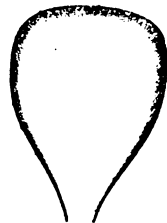
ing demand of the present. This is too often the case, many a man, in many a good man's garden, suffers privation, of which the owner of the domain knows nothing; but a proposal from the town of Bromley has opened a new source of gain for the funds of the Society, in the production of which the gardeners will be the principal contributors, a Horticultural exhibition is to be held there, to which gardener's will contribute specimens of skill. The prizes to be awarded, however, are not to be paid to the gardener or amateur, who wins, but to be subscribed to the fund of the Society in the name of the winner, who will therefore become, *bona fide*, a subscriber to a certain amount, and be entitled to all the privileges. Now this affords every gardener an opportunity of trying his fortune, and, by taking the best he has, he may become a winner of prizes enough to make him a life subscriber. The Bromley gardeners are at this time the very life of public exhibition, they have been the main support of the Horticultural Society and all the leading shows within a few miles; and therefore no place could be selected with better prospect of producing a first-rate exhibition; and if, as we have heard a gardener say, it be true, that the Bromley gardeners being on the spot stand the best chance, it must be recollected how often they have gone their, ten to twenty miles to meet others who were at home. But if this show be rightly conducted, it will be an example which other places should be made to follow; for instance, Ealing might have its show, and Mr. Lawrence could of himself furnish plants enough to form it; Wimbledon might have its show, and the three or four first-rate garden establishments in the neighbourhood, could, unaided, find plants for the occasion; Cheam, Clapham, and fifty other places may follow the example of Bromley, and at each place all the world might compete, but we can see no means of adding to the funds more legitimately than by means of public exhibitions, which would, if properly supported by gardeners be the best shows of the year. Bromley, however, has taken the lead, and we are only fearful that its management is not sufficiently local to carry out the good intentions and good feelings of the neighbourhood to the extent it might have done. For instance, one half the Kentish people required to do anything for the show, would have done it at the cost price or for nothing. Many valuable services would have been given gratuitously. The folding of circulars, the filling up and issue of tickets, the publicity given by many different persons to the object, would have been done by gentlemen who would have delighted in being useful, and in saving expenses. This has all been undertaken by the society itself,

and is going through all the costly and mechanical means usually adopted for feasts and fêtes of a more profitable description, and the consequence will be a large deduction from the money received, and consequently much less credit to the town and the gardens, to whose honour be it spoken, the production of the show is entirely to be attributed. We trust there will be abundant success in spite of the transfer of the management, and that there may be at least enough money to pay in every winner's name the full amount of the prizes to which they may be entitled, they will then have the pleasure to be enrolled among the subscribers, and have some influence in the elections.

### THE PERFECTION OF FLOWERS.

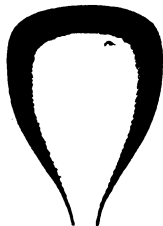
#### NO. I.—VARIATIONS OF THE TULIP.

It has been said by some of our northern stars among the Tulip growers, that they are more particular about the markings of a Tulip than we are in the south. This is not exactly true, but it is true that the northern growers would give a prize to a beautifully marked flower when the inside was foul and dirty; while the southern growers would not allow a foul bottomed flower to have a prize at all. It is also true that the southern growers would give a prize to a flower which had no regular marking if the bottom was perfectly pure. But this only goes to show that prizes are by the southern growers awarded for the marking by comparison, but that with respect to the bottom, the least stain turns a flower out altogether. But the southerners require as an essential point in the perfection of a Tulip, that all six petals shall be alike in the marking, and that the marking shall be uniform, and any deviation from this is a blemish; yet so rare is it to see Tulips perfectly uniform, that the oldest judges cannot recollect such a thing. This, however, being perfection, the nearer a flower can approach it the better. Of the various styles of marking, there may be said to be ten very distinct, and each of these styles may be seen in numerous varieties. Let us take the most delicate of all, the slight even feather, equal all round the outer edge, and forming



a beautiful contrast to the pure white or yel-

low, of which the Tulip is composed. There is no other marking so delicate as this, but if all six petals are not alike, if the three outer ones be not as perfect as the inner ones—and that is rarely the case—the flower is not perfect; so also if there be any breaks in the feather, they are to be counted as blemishes, and when one flower comes nearer to another in general character, and is equal in shape and colour, and in all other respects, the one whose feather is the least broken is accounted the best, because it is nearest to perfection. These feathered flowers vary in the depth of the feather much. We have seen Catalani, Triumph Royal, Strong's King, Gloria Mundi, and some others are now pretty nearly as fine in this style as any, but even those which are called even feathering, may be heavy or light; for instance, the following is as even as the narrow one, and yet is a feather as heavy as it could be, to be even. When the colour is



very dark it forms a very striking object, the contrast is much greater than when the feather is narrow, and according to our notions, nothing can beat feathering of this description, whether it be the narrowest (which is called light) or the broadest (which is called heavy) or any of the grades between them, it is almost impossible to conceive any thing more beautiful; we have seen Rosa Blanca in this style. The next style, we shall notice, is the unequal feathering, which is beautiful in its way, and if uniform, has as many admirers as the equal feathering. Here the centre

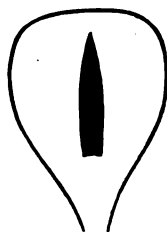


of the feather runs down a little, but there are no bars nor pouncy spots, the colour is as much concentrated, the marking as perfect, the feathering as close and regular as in the former, and a Tulip so marked is beautiful. Polyphemus is often seen in this style, Lawrence's Duke of Clarence and Sultan as well as many others occasionally bloom so. But

there is another style of feathering which may be noticed as irregular, for the white or yellow seems to form a flame as it were in the centre, and the feathering is exceedingly close, and occupies more room than the ground colour. This is only a favourite when the



colour is remarkably good, and the ground remarkably pure, but here, as in the other cases, the six petals must be alike. All these four different styles are properly called feathered. In all four, and in all the modifications of all four, a break in the feather, that is, any place where the ground colour runs through to the edge, is a great blemish, and will be counted against it in the event of any others coming nearly even. We have seen Shakspeare often in this style, and at Mr. Rutley's sale, the first specimen perhaps that ever was seen, was sold in this state. Other styles of marking may be called flame, and of those there are many varieties; the following is the most simple, and we only know one



Tulip so marked, which is "Princess Charlotte, Cenotaph," a white flower with a single bar or flame in each petal, it however frequently has it only on three petals, and sometimes not at all, exhibiting a pure white tulip. The next is more complicated, and rarely comes perfect in any flower, but we have seen it occasionally in Holmes' King, or Plus Belle, Strong's Esther, and some others variously



modified, but without the slightest indication

of a mark on the edge, or any where but in the flame in the centre of the petals. The feather and flame together is esteemed greatly, but it is very difficult to find them, without the one running into the other and spoiling both; the perfection of flame and feather is to have the flame distinct and independent in the centre of the petal, and the feathering all round the edge, but the feather must not reach the flame by branching downwards, nor must the flame reach the feather by branching upwards, whereas nine out of ten run into one another and form a mass of confusion which no judge would attempt to estimate. It has been the fact of such things getting prizes that led the northerners to say, we cared nothing about marking, whereas we have not a jot more affection for these flowers than they have. It is, however remarkable, that all, or nearly all the flowers which are perfectly pure in the ground colour, or rather the white or yellow, and are without a spot or blemish in the bottom, are the least inclined to come perfect in the markings, whereas many of those which have stained bottoms, and are what we southern growers call foul flowers, are remarkable for their fine constant marking in either feather or flame, or both. This then is the great difference,—the southern people let the foul or the pure bottom be a matter of comparison for the judges, and sacrifice that point for regularity of marking, and we let the marking be the thing to compare, throwing out altogether as unworthy to be shown, any flower with even a slight stain, however beautiful it may be in all other respects. To illustrate the different style of the feather and flame coming together, we first point out the following which is an exemplification of a slight feather and flame, we have



seen Rose Camuse in this state, or something bordering very closely upon it, and a rich looking flower it is. The mass of colour which is formed on the inside close down to the shoulder, gives the round pure bottom a striking appearance, and probably forms the most rich and beautiful inside that a Tulip can possess; vary this by supposing the centre flame as it is called, much heavier, and the feathering wider, and we have still a very beautiful object, and it is on these variations that the charm of Tulip growing greatly con-

sists; for instance the flamed Tulip of this year may be a feathered one next, and *vice versa*, and it is quite impossible to calculate from the



appearance of a variety this year, what it will be next; there are certain matters which remain nearly the same, for instance the form, the purity of the bottom or inside, the texture of the petal, the smoothness or roughness of the edge, these are sufficient to tell a good judge what flower he is looking at, whether it be ugly or handsome in the marking, but nothing can be less calculated upon than the marking of Tulips from one year to another: that which is beautifully feathered this year, may be flamed next, and that which is richly feathered and flamed this year, may be neither next, but an incongruous jumble of marks without regularity or form. Still the southern growers will have the clean pure white or yellow at the bottom, and risk the rest rather than the most constant marker as it is called with the slightest cloud or mark on the under base of the flower. The next is the heavy feather with a light flame, which varies the appearance very



much, but it is nowise worse than the others, if it be only uniform, that is all the petals alike, for in this consists every thing belonging to the marking: all variations would be but objects of comparison, mere matters of taste, for there may be a thousand modifications of the feathers we have mentioned, and yet not one which may not be an excellent show flower; say it were like the following, which is



still another mode of developing the flame and feather, nothing can be prettier than all the ten varieties we have given, and every one may be varied twenty different ways without offending against the rules. The northern growers have depended however so exclusively upon the marking of a Tulip, that they have actually been bitten with a notion that when a Tulip differs, it must be some other flower, because we have Tulips flourishing under a dozen different names, all described in a very particular manner, and valued at different rates according to the marks they produce. Hence the number of names from long cata-

logues where very few names would comprize the whole collection, while half a dozen names represent Tulips that actually differ no more from each other than Polyphemus and Albion. As general faults in the markings of Tulips, all vacancies on the edge of a feathered flower, all bars, or pouncy spots, or blotches, are bad, confused masses of the breeder colour, and the six petals not alike, are condemnatory, and although as we before said, it is possible for a stand of ill marked flowers to take prizes in the south, it is impossible to get one awarded to a foul bottom, such is the determined hostility.

## GLENNY'S GARDEN PRACTICE.

### KITCHEN GARDEN.—JUNE.

HERE, a good deal of the work is but a repetition of last month's; for instance—

**PEAS.**—Continue to sow Prussian Blues, Marrowfats, and any of the new sorts adapted for the season, for they are always acceptable when they come, and the seed is not much loss if they do not. This, however, rather applies to later sowings than to this. Earth up any that require it, and remove the haulm of any that are done with.

**BEANS.**—Those who like broad beans better than I do, and wish for a late supply, may give one more sowing. Top all those that are beginning to bloom, earth up those that require it, and get in a few more rows of kidney beans.

**SCARLET BEANS**, if not planted, may be got in directly, and if well watered will still bring a good crop. If done last month, and up well and strong, so much the better, but if not strong get in some more.

**SALLADS** as last month. Sow the sorts of lettuce, plant out those which are ready, and continue (for those who like it) the sowing of Mustard Cress, Raddish, and Rape, for small sallading.

**TURNIPS.**—Sow the first week turnips in a well dressed piece of ground, but not too many of them; towards the end of the month get in the full crop, though I must confess, that in turnips as in everything else, I prefer for a family, often sowing small portions, to providing a full crop of everything.

**POTATOES.**—Fill up spare ground with late sorts, and if there be any great want of water, supply it artificially; this would be generally considered the main crop, but since Chapman's potatoes have been in cultivation, I make that sort my principal crop, for I can plant them in July, take them up in November, and use them as new potatoes till June.

**CABBAGE, BROCOLI, AND BRUSSELS SPROUTS.**

—Transplant a few after the first good shower. If you are obliged to plant out before one comes, soak the whole ground well the day before, and water them well in at the time. Sow more brocoli, and some cabbage.

**CARROTS.**—Sow some about the second week to pull young.

**ONIONS.**—Sow for the same purpose, and about the same time.

**HERBS.**—Gather for drying before they open their flowers; this is generally delayed until half the aroma of the plant is wasted in the sun, and spent in the bloom, Mint, Thyme, Balm, Sage, Marjorum, and all other herbs usually dried: hang them up in the shade to dry, under a shed in the open air.

**CELLERY.**—Plant out some in trenches not very deep, as they will be for the earliest use. Salary for show must be planted out in trenches a good twelve or fifteen inches, and two feet wide.

**CUCUMBERS** must have occasional air, fresh linings when the heat declines, water when they require it, but not too much. All the water ever given should be placed in the frame in some vessel so as to get the same temperature as the atmosphere inside, cold water is injurious, not only to the fruit swelling but to all the advancing blooms. Those sown last month for ridging out should be thinned, if they are more than three in a pot, as soon as the rough leaves indicate the most healthy. If there were none sown last month let some be sown immediately. Those also who eat vegetable marrow, which in fact are the different kinds of gourds in a young state, should sow directly, if it be not already growing.

**SPINACH.**—Continue to sow at intervals as before, choose the round leaved sort and allow it to grow large enough to cut before you thin it out.

## FRUIT GARDEN.

**VINES.**—The branches must be stopped one joint beyond the last bunch of fruit intended to be left on. On some branches will be found three bunches three times out of four: I should remove the two weakest altogether; and nine times out of ten I should remove one, but unless the crop be very light indeed, I should never think of leaving more than the best bunch on each shoot, and stop the branch just one joint beyond the bunch I left on. All the shoots intended to be allowed to grow for bearing next season, should be fastened to prevent them from being blown about or damaged, and all shoots but these should be removed, none of the tendrils ought to be left on, and however fine and tempting the healthy shoots may look, great care must be taken not to allow too many to remain. I have before observed, that nine-tenths of the vines are spoiled by forcing them to do too much, this above all things should be avoided. It is far better to have healthy wood, and few but fine fruit, than to let a Vine dwindle into wirey little shoots by having too much fruit and too many branches.

**APRICOT AND OTHER WALL FRUIT TREES.**—The first care here required is to remove useless shoots, and thin the fruit into a reasonable quantity. The useless shoots are those which come where there is already great abundance, and also one half in general of all the shoots, leaving good healthy ones at proper distances to enable you to lay them in well and train them; those which grow right away from the wall, may be always taken away unless the wall is very bare in that place when it is worth while to make an effort and bend it back to nail it to the wall, though these foreright shoots always made an awkward appearance when bent down and trained, so that except when the wall is really bare and young wood scarce, it ought not to be attempted. I have seen great pains taken with wall fruit trees which have been allowed to put forth their foreright shoots all over the tree when they were inclined; and although these shoots which grew straight from the wall had not support, they have been allowed to bear and grow under subjection, so that there were fruit eighteen inches from the wall, besides a goodly crop on the branches, that were fastened to the wall. These trees always appeared as if they were half of a standard tree stuck against a wall, and in some cases bore a considerable quantity over and above what the flat wall would have held. These trees bore finer fruit than a standard, and ripened the fruit when a standard would not, but not so fine as when the branches were all confined to the wall, or cut off: nevertheless, when foreright shoots are taken as

much pains with as the others, and properly thinned out, they do increase the quantity of the fruit, though not the quality; and it is especially applicable to Pears, Plums, and Cherries.

**BUDDING** may be performed towards the end of the month, and July will be more proper when you are not pressed for time. Nectarines, Peaches, Apricots, the various kinds of Plum, &c., may be budded on the common plum stock raised from the stones; bud them six inches from the ground—but unless it is to save buds that you cannot have at a proper time, wait awhile.

**STRAWBERRIES** may be planted to form new beds. Select the plants that have struck root at the joints of the runners; and if you pin down some of them at the beginning of the month, they will root well by the end. These may be planted at the end of the month, but they must be shaded and watered; water regularly, beds that are fruiting.

**GOOSEBERRIES AND CURRANTS.**—In picking this fruit do not strip the trees one at a time, but gather the berries or bunches so as to leave a few three, four, or six inches apart, all over the branches; they will make splendid fruit to ripen.

## FLOWER GARDEN.

The Flower Garden this month presents plenty of work, for not only do the flowers which have passed their bloom require care and attention, but a continuation of last month's duties are requisite to almost all the subjects; in short, the first direction ought to be to read last month's ample instruction, do all that is there recommended, if it has not been already done, and if you have already done it all, do as much as you can over again. The business of June is in most cases a continuation or a repetition of that for May. Have you planted out annuals, Dahlias, clump plants, and the numerous border flowers, do the like all over again where it has been unsuccessful, or where you have room for second seasons. It is the great similarity of all the affairs of the month that render the instruction somewhat short, still, I presume the reader will expect these matters to be more defined; therefore, under the several heads the practice of the month may be given in few words.

**AURICULAS.**—These must not have much sun, the drainage must be frequently examined, dead and dying leaves be picked off, occasionally refreshing, but not heavy waterings must be given, some persons repot them at this time, I do not. I find repotting at this time sets them growing rapidly, and they are almost sure to bloom in autumn.

**TULIPS.**—As the foliage of the out-beds

turns yellow, take up the bulbs carefully, place them in their proper position in their boxes or into their regular bags or baskets, but do not take off the mould nor break off their stems; let them be cut off all but half an inch where it joins the bulb; let the cloth be completely drawn up, that the best bed may have all the sun, air, and rain, and take up the bulbs as soon as the foliage decays or turns yellow.

PANSEYS must be shaded to do any good, and, when the sun has gone down, or before it is up, they ought to be well watered. Cut off or pick off decaying blooms instead of allowing them to seed.

HYACINTHS, NARCISSUS, JONQUILLES, and other bulbs, of which the foliage has decayed must be taken up and kept dry in boxes, except fritillarias, which are better in the ground, or if taken up must be kept in sand, as the bulbs are only a succession of scales which would dry up if exposed.

RANUNCULUSES, shaded from the sun all day, and let the shade be distant in preference to close; they never get it, but they deserve as much care and attention as the Tulip, they ought to have just such a protection with the cloth to roll up and down, and all the other contrivances for giving air and keeping off rain and sun. They must be watered copiously without wetting the flower.

CYCLAMENS, take up the bulbs where the leaves have decayed, but not until that change has taken place; those in pots may be turned on their side, instead of being removed, if it be any more convenient.

AUTUMNAL CROCUSES, *Amaryllis lutea*, and all other autumn blooming bulbs should be now taken up for removal, and when it is desirable this is the proper time for purchasing and planting.

PINKS are raising fast for bloom, allow only one stem to a plant, and but two flowers to a stem; towards the end of the month, take off the grass as it is called to make pipings, and strike them under hand-glasses; tie up the flower buds with bast matting half way up the bud that the pods may not split. As the large petals of the flowers called the guard petals, which ought to form the lower ones develop themselves, place them carefully down, many place cards upon the buds, upon which the large or guard petals are brought down flat, but it is better without if it can be managed. The next sized petals should be brought down also as they bloom, laying one over each pair of the guard petals, so on with a third row if there be one, and cover the pairs of the second; the other must form a crown or high centre, and any that happen to be ragged or self-coloured, or in the way, must be

pulled out. They must have no sun, nor rain to wet the flowers when they once open; oiled paper caps held above the flower with a stick are mostly used: when the first flowers are perfect, the work of propagation must be done, by piping, that is the sprigs round the bottom of the stem are taken off two inches long, the lower leaves stripped off and planted in rich earth, watered till it is like mud, hand-glasses covered over them, and shaded from the mid-day sun.

ROSES bud as soon as the stocks have grown enough to offer an opportunity; their bark should readily peel off. Take a bud from a rose you wish to propagate, cut it off with its leaf and half an inch of the bark, turn up the bark then, and take out the little wood that is under it: then cut a slit an inch long down the branch which is to receive the bud, then cut it across in the middle, thus forming a cross. With the handle of the budding knife, or a sharp piece of wood raise up the bark on both sides, tuck in the bark of the bud under each side of the bark raised in the stock, fit the leaf and its bud exactly at the cross point, tie the bark of the stock down with worsted-yarn or bast matting, cover it with loose damp moss for a few days, and the union will be complete; then cut away all the useless portions of the stock. China rose-cuttings may also be struck under a hand-glass.

APHIDES, which infest Roses, Carnations, Dahlias, and others, should be syringed off with clean water in the evening, after sun set, or morning before the sun is upon them.

CUTTINGS of Fuchsias, Geraniums, Heliotropes, and all sorts of greenhouse plants may be struck, and struck cuttings may be potted off into small pots.

ANNUALS, plant out in the borders, make a second season to those planted out last month, wherever there are vacancies they may be diversified with regard to the colours of the plants in the vicinity, it being always better to give a contrast, red flowers would not look so well among the crimson sweet Williams as white, yellow, or blue would, and so with regard to other colours. Seeds may be sown at the beginning of the month, to bloom where they are sown, and those which are up should be thinned out to give them good room to grow and bloom. Sweet Williams, Wall-flowers, Canterbury-bells, Columbines, Polyanthus, Pink, Carnations, and most other biennials and perennials should be planted out at the end of the present or the beginning of the next month, into beds at a reasonable distance apart, or in borders where they are to remain, but one's natural anxiety to occupy borders with flowering plants that will bloom in the season, induces one to prefer beds for the nursing of

those things till the decay of flowers makes room for them, when they can do nothing towards keeping the place bare of flowers.

**CARNATIONS** and **PICCOTEES**, which are in their blooming pots, require to be refreshed with water occasionally, for they must never be stinted. These like pinks must have but one stem to a plant, and but two or three buds to a stem; the exceptions to this rule are made in cases where the flower is naturally very large and very full, giving the plant more blooms to perfect is, in such a case as this, advantageous, as it makes them, both smaller and thinner and therefore more equal with their naturally smaller neighbours. As these ought not to be opening any of their flowers this month, and would be much too forward to show if they did, I say nothing about the management of the bloom. In fact, if any were so forward, I should consider them no use, and let them take their chance, or else take off the forwardest buds only and leave the latest or laterals to take the place. You should keep a very sharp look out for earwigs, for one of these gentry could in a few hours eat off the petals at the bottom, and totally destroy the finest flower in a collection. It is better therefore to be sharp beforehand, and see that there be none harboured ready for mischief when the bloom comes.

**PROPAGATING** the best double wallflowers by slips is performed when the bloom is over, and the new summer shoots are an inch to an inch and a half long. These slipped off and put in an ordinary shady border with a hand-glass over them and well watered, will strike root very readily.

**TALL BORDER FLOWERS** and all that have a tendency to lop about, should be neatly tied up to sticks. Those whose blooms are decaying or have decayed, should be cut down or taken up as the case may require.

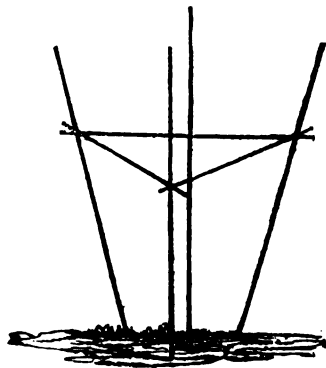
**THE BORDERS** may be enriched with *Geraniums*, *Fuchsias*, *Verbenas*, and many other greenhouse and frame plants, which will bear planting out in the open ground and bloom well until the frost cuts them off. Many seedling plants are found not worth naming, though very gay, such as *Calceolarias*, *Cinnersarias*, *Petunias*, *Verbenas*, and others. These add greatly to the beauty of the borders, while the fact of their being worthless in a floricultural point of view renders their perishing of no consequence, yet often do subjects escape the effects of frost in September, and literally bloom half through the winter. Weeding gravel walks as well as borders, cutting box edgings, mowing lawns, raking off the daisies with a proper daisy rake, cutting the edges and the verges of grass smooth and clean, stopping the growth of any flowering shrub that may be running out of shape, or

the branch of any that may be growing too vigorously. Watering the borders well when they require it (and this is pretty nearly always be the weather wet or dry when they are overhanging with trees), are matters of course at all times.

The greenhouse plants which are out of bloom, should be disposed of as already recommended, if they have not already been attended to, they will be better for all the air, some of the sun, and whatever wet may fall.

Those plants which are being grown to a size in pots, must be constantly shifted from one pot to another, and kept near the glass of their respective frames, houses, or pits, of these, *Cock'scombs*, *Hydrangeas*, *Balsams*, *Egg plants*, *Rodanthe Manglesii*, *Triverania Coccinia*, *Schianthus*, &c., are the principal, and give ample opportunity to the gardener to exercise his skill. The greenhouse ought to have as much air as possible, unless the plants are taken out and there are vines in it. If so, there will be naturally a great difference, but generally speaking, plants and vines do not well agree, and the anxiety to accomplish both purposes—plant growing and fruit growing—often defeats both. The one or the other ought to be exclusively attended to, and the second takes its chance.

**DAHLIAS.**—Those planted out last month must be tied up to their stakes as they advance in growth, and this may be done after many different fashions. Many use four stalks placed something like the annexed, but so as all the principal branches are well supported out of



each other's way, it matters but little how they are disposed. I use a single stake in the first instance; as the plants advance I add others, according to the wants of the plant, and have frequently found six or eight stakes to a very large plant before the season was over. I have repeatedly said the watering of the Dahlia should be done in earnest—the whole ground fairly drenched, as a hard rain would drench it; one watering a-week like this is better than one a day half done. I believe few reconcile them-

selves to this; but the rain will frequently save them from one of the weekly waterings, and that is an object. I am quite sure that the mere dabbling or sprinkling the surface, which too many call watering, only draws the fibres there, instead of letting them go down after it, and then a little hot sun checks the plants, and throws all the bloom into semi-double flowers. Let the roots work for their wet; and when you do give them any, let it be enough to go down after them. Plant out Dahlias directly, if you have not done it before; and if you have, plant out some to succeed them, especially if you calculate on showing. It is, however, worth turning back to the Treatise on the Dahlia, if you are cultivating them in good earnest. Above all things trap the earwigs by all the modes pointed out, so as to clear them right away before the bloom arrives; it is the only way to get clean flowers.

#### ON PROPAGATING AND PRESERVING TENDER PLANTS.

OUR flower-gardens are now, during the summer months, in many cases, almost exclusively decorated with exotics; and too much cannot be said in favour of a practice that enables them to rival, for a time, the sunlit scenes of happier climes, from which we have lately received many plants so perfectly suited to such a purpose, and so exquisitely lovely when displaying their beauty in masses, that without them our gardens would be a blank indeed. What, in all the range of floral beauty, unlimited as it is, could compensate us for the loss even of that single group, the matchless verbenas? The duration of plants used for this purpose, under the mode of culture this practice has introduced, is only annual; as they require to be propagated in autumn or spring, produce their blossoms during the season, and perish at its close. As they cannot be turned out with certainty of success until the season is far advanced, the small plants require to be planted thick enough to cover the soil, and produce an immediate effect. Thus a moderate-sized garden requires several thousands of plants to furnish it annually, a prospect that would have appalled even the best gardeners of yore; but at the present day, where sufficient means are allowed, the propagation of the plants is a matter of no difficulty. In cuttings, put in during February or March, failures seldom occur: when they do, they are generally the effect of too much confinement, and not, as is often assumed, of too much water. As a proof that cuttings when allowed plenty of air can hardly be over-watered, see with what facility most sorts strike root in water only. Plants are continually dissi-

pating the moisture they extract from the soil into the atmosphere that surrounds them: they are, therefore, in constant action while the least difference exists between the moisture of the soil and atmosphere; and it is only while thus employed that a plant can be said to be a living thing, inaction being as incompatible with anything possessing vitality in the vegetable as in the animal world. Therefore, plants shut up until soil, plant, and atmosphere are alike impregnated with moisture, have every energy destroyed, and are often virtually dead long before appearances indicate it. This is too often effected by the universally-recommended bell and hand glasses, producing a stagnation that speedily converts the very source of life into the cause of death, and renders the most extreme caution in watering necessary, the least excess fatal. But, allowing plants so treated ultimately to succeed, being placed where they can exist without an effort, it cannot be supposed that they will produce roots with the same dispatch as those that are forced to maintain a continual struggle, and feel the want of them. For the sort of cuttings we are speaking of, during the early part of the season, double glass is altogether unnecessary; watering them overhead during sunshine, while air is admitted, will prove of more service than covering them with glasses or shading, a practice that ought to be avoided.

The inexperienced will find a frame with a little bottom heat, covered four or five inches deep with light soil, the cuttings planted in the soil, a most efficient apparatus; and those who possess a stove or hothouse will find that cuttings in pots, plunged in the bark bed, and fully exposed to the light, will root without further trouble.

But, as I have already said, this is too simple an affair to be termed a difficulty; but the introduction of so many plants into the houses at a time when those wintered there are beginning to grow, and require more room, is a serious evil; to remove which as soon as possible, we are apt either to turn out the plants before the proper season, when they often suffer so much from premature exposure, that we are forced to replenish the beds, or endure their squalid appearance during half the season; or to retain the young plants, fifty or sixty together, in the cutting-pots, until they are finally turned out. This, no doubt, saves room, the labour of potting, and watering in a great measure; but it is the practice of the sluggard, and ought to be avoided with all his doings, as the plants invariably thrive better when potted singly, and allowed to establish themselves in the pots. To avoid these habits, and still retain house-room for more important purposes, select a sheltered spot, fully exposed to the sun,



over which erect a temporary framework of rafters to support a roller, with canvass or matting. Cover the bottom of the space enclosed with sand. When the plants have been potted off, the pots filled with roots, and tolerably hardened, let them be taken to this shelter, carefully turned out of the pots, and each plant placed upon a small piece of turf previously placed upon the sand. As the plants are not expected to increase much in size while they remain here, they may be placed rather close together, thereby sheltering each other, and making the most of the space covered. As the plants are placed, let the space between each be filled up with sand, when they will require little attention, save an occasional watering, until they are removed to their final destination. Under such a shelter, the hardier sorts, or such as have been propagated in autumn, may be placed as early as the 1st of March; the pots, and the room in the house that they occupied, to be employed in forwarding others to be treated in the same manner. High or cutting winds, heavy rains, and cold are to be guarded against, during which the canvass must remain down.

The mere saving of room is not the only recommendation such a practice possesses. When the plants are taken up with the small piece of turf attached, it will be found that they have formed numerous strong and fleshy spongioses, ready to seize upon the soil with the greatest avidity. They likewise suffer much when taken from under glass, and exposed to the direct influence of light: placed out so early, the cause is less powerful; the effect, consequently, less felt; and what do they suffer in appearance is entirely recovered while they remain where their appearance is not of the smallest consequence. Those who possess propagating-houses, and every convenience to supply the plants required of them, may deem it unnecessary to employ such an auxiliary; but the number of such is limited indeed, when compared with those who happily take an interest in a garden, and strive to make the most of the means placed at their disposal; to those who have only a greenhouse it is invaluable. Persons so situated would do well to propagate as many as possible in autumn; retain them in the cutting-pots during the winter, allowing them plenty of air, as the best safeguard against damp, the greatest enemy to plants at such a season; pot them off, and place them under the shelter already recommended in spring. When judiciously managed, it is surprising how many plants may be thus produced, even by a single frame. Annuals intended for planting out in beds, for which purpose there are many sorts well adapted, ought to be sown in autumn, and treated in every respect like cuttings, when they will

produce a far finer display than those raised in spring.

Specimen greenhouse plants in pots, placed singly or in groups upon the lawn, when properly introduced, produce a fine effect. To prevent plants so placed having their roots injured by the action of the sun upon the pots, they ought to be plunged, or otherwise covered, and proper drainage secured. This is generally effected by a stratum of coal-ashes; but I have often had occasion to plunge plants where the remains of the ashes, turned up in digging, appear unsightly in the extreme: in these cases I drained the pots containing the plants by placing a small empty pot beneath each, and found the result so satisfactory, that I have adopted this plan wherever plants are plunged, it being free from every objection that applies to ashes. Pots are easier applied and removed; and more effectual, as by them worms are completely excluded. The plunging taking place when the pots required for drainage would be lying idle, they may be so applied without any sacrifice.

F.

#### SINGLE AND DOUBLE STOCKS.

THERE is certainly a mystery about this particular branch of floriculture in which others are not involved. For instance, it is a well-known fact, although to me utterly inexplicable, that the same seed under the management of one individual shall produce nearly all double flowers, while under that of another it shall produce all single ones. Again, a handful of plants shall be taken out of the bed in one garden, and transplanted into that of another, and bloom single, while those left behind, shall be double; and *vice versa*.

Two years ago I had a few plants of the Queen's Stock variety given me by a gentleman's gardener, from which I had a fair proportion of extremely fine double flowers, while the gentleman himself had not a double flower in his very extensive gardens. This seed was sown early in the spring, and in the autumn the plants were in my opinion much too luxuriant. This, I confess, might have been the result of prejudice, as it had been my invariable custom for many years to sow my biennial Stock seed in July, without once suspecting that my frequent failures might possibly be attributable to that circumstance.

About twenty years ago I had a most beautiful variety of white Bromptons; I never saw any so good before, nor have I seen anything like them since. I then resided in Oxfordshire, and obtained at first about one double flower out of every three or four plants. Every succeeding year, however, I continued to obtain a less and less proportion of double ones for four

or five years, when I removed into Berkshire, and hoped, by the change of soil and proper attention to the rules I had treasured up in my mind relative to the culture of this plant, to restore my stock to their original popularity; but in this I was mistaken, for they grew worse and worse every year, till I got no double flowers at all.

It is an old saying that Stock seed should be saved near a double flower; but as I have always been particular in following this rule, I must confess I have not much faith in its virtue. There is another maxim, that appears more reasonable, namely, that seed should be saved from such plants as show a disposition to double, by producing a greater number of petals than the perfectly single flower. But attention to these matters, or the neglect of them, will not account for failure and success from the same packet of seed, &c., above alluded to. Indeed there appears to be more in the time of sowing and planting than at first might appear probable; and I should therefore feel obliged for any practical observation on that part of the subject. Again, as to the necessity of changing the seed occasionally—whether one description of soil is more likely than another to produce double flowers—whether land in a high state of cultivation or otherwise; again, whether the strongest or weakest plants are more likely to blow double—whether the formation of the root has anything to do with the secret, some being very fibrous, and others running into the earth with a tap-root.

Brompton and Queen Stocks continue in bloom the whole of the summer, and good handsome double flowers never fail to attract the notice and excite the admiration of all lovers of the garden, and I therefore hope the subject will not be undervalued, but that every one who has anything really important to communicate on the subject will have the liberality to do so, and thereby confer a benefit on the public.

If any one should feel disposed, in reply to this, to notice the time of sowing, he will have the goodness to mention the nature of the soil, and the forwardness or backwardness of the locality, as compared with London.—J. H.

[A few years since, when the German seed was introduced, we halved every packet with a friend, and while his were nearly all double, ours were nearly all single, and we sowed about the same time; and we are glad the subject is brought before us, that we may elicit something from the more experienced. Mr. Hopwood, of Twickenham, used distinctly to affirm that if the moon was increasing when the seed was sown, they would come double, but if it was past the full they would come single. This

seems romantic; but *he* believed it, and no body ever grew better stocks—indeed he had the Banksian medal for cut blooms of that flower; not that this stands for much, because Mountjoy once cut the flowers from a seedling bed of Sweet Williams, without the least novelty, and we believe without any other idea than that of getting into the gardens cheap, and to his astonishment he had a medal awarded for them, though thousands of cottagers with a pennyworth of seed could do the same thing. However, there was merit in Hopwood's Stocks, for he grew them better than any one else, and there were twenty or thirty varieties.]

#### THE COMMON SUNFLOWER.—ITS USES AND CULTURE.

By W. TAYLOR, F.L.S.

WILLIAM TAYLOR, F.L.S., has made various experiments for the last ten years upon a plant commonly known under the name of the sunflower, which he considers might be introduced into field culture with great advantage in several different views.

It is the *Helianthus Annuus*, a native of Mexico, though it appears to be indigenous to many parts of the world. It is found wild in the southern districts of Africa, and very common in the East Indies, where it is called the Soorooge-mookey, or sun-starer.

The plant is an annual belonging to the natural order *Compositæ*, attaining the height of from three to four feet; it agrees with every rotation of crops, and succeeds in all soils, provided there is sufficient depth of mould for the plants to derive proper support and nourishment; and, if the necessary space be given to each plant to spread out its branches, it attains the highest perfection.

In regard to the situation, it should be chosen so open as to expose the plants as much as possible to the warmth of the sun, as the crops in such places not only ripen and fill the seed, but the plants are considerably larger in growth than in those which are close and confined.

In preparing the ground for this crop the land should not be rendered light by too much ploughing, but be in a firm state of mould in the more superficial parts, and the plants should always be kept clean, and free from all kinds of weeds, the first month or six weeks after the plants have made their appearance; and the Sunflower should be manured with the ruins of old buildings or walls, for the plants succeed best in the earth that is mixed with a material for the production of nitrous gas, and even nitre itself is very abundant in the *Helianthus*; and the number of bushels of lime rubbish required for an acre would be about

thirty, and the value of the thirty bushels about ten shillings.

The proper season for sowing must in great measure be regulated by circumstances; but the earlier the seed can be got into the ground the better, say the beginning of April, as the crops will be ripe and ready to harvest the latter part of August, which will be of the greatest importance to the grower: and the necessary quantity of seeds required for an acre depends upon the condition of the soil, and varies from 4 lbs. to 5 lbs.; but it is of course advisable to sow a little more than is actually wanted, to provide against any unforeseen accidents which may happen to the seeds before germination.

The seed should be drilled into the ground, and the distance from row to row eighteen inches, and the plants to be thinned out to thirty-six inches from plant to plant; and the number of plants at this distance would be about 14,500 per acre: at eighteen inches from plant to plant, 25,000 per acre; and at twelve inches from plant to plant, 32,000.

After culture, the land between the plants should be kept quite clean from all sorts of weeds, but especially while the plants are in a young state of growth, and as soon as they have risen sufficiently above the surface of the earth, the work of after culture may be readily accomplished by a single horse hoe-plough, so as to cut up the weeds and stir the mould well, and lay it up a little to the roots of the plants, and the parts between the plants in the rows may be cleared or cleaned by a small light hand-hoe. Where, from the nature and quality of the land, the plants rise to a great height, they may be pruned, and some of the lower branches taken off early with great advantage to the crops in their growth and produce of seed; and he made many experiments on the plants to endeavour to produce them as dwarf as possible, and by so doing he increased the quantity of seed very materially; and by pruning plants three feet high down to twenty-four inches, he succeeded in this way, never attempting to prune or cut a plant till he perceived some small heads, about the size of a common nut, making their appearance out of the sides of each leaf, then he begins to prune the plants down to twenty-four, and in a few weeks they begin to branch out at the sides.

**HARVESTING THIS CROP.**—In performing the business a number of baskets are provided in proportion to the extent of crop, and placed in the field, into which all the large heads of the plants are gradually taken off as they become ripe, and the heads of the plants are conveyed to a machine similar to the Indian corn mill, where the seed is readily scratched out, and the refuse burnt for alkali.

Where this method is practised, often prevents the depredation of birds and other vermin, as well as the shedding and dropping of the seeds upon the ground, by which a very great loss may sometimes be sustained; and another great advantage in growing this sort of crop, as it rather serves to improve the soil than to exhaust it, for the Sunflowers receive most of their nourishment from the number of large leaves they have on their stalks, and having no large roots like many other plants, but principally consist of small fibres that do not run deeper into the ground than two inches.

The produce of this kind of grain, like that of most others, varies considerably according to the state of the soil, climate, and the cultivation that is employed; but the average quantity of seed about fifty bushels per acre; fifty bushels of seed produces fifty gallons of oil; and the refuse, after the oil has been extracted, made into oil-cakes, produces 1500 lbs; and the stalks when burnt for alkali give 10 cwt. of potash, besides paper, hemp, and other useful articles.

This plant is not liable to disease, such as the blight, mildew, or others of a similar nature, but generally in a blooming healthy state; and although some insects may fix and shelter themselves on the flowers or heads of the plants, they cannot from the close compact state of the seeds in them, lodge in their interstices, consequently the tom tits, which are perhaps the greatest enemies to these crops, may not only seek the insects as their food, but at the same time plunder the seed of the flowers, as it is certain and well known that they not unfrequently work it out of the heads, and even before it gets full ripe. The capability which these birds possess of suspending their bodies in a backward direction upon the flowers, also tends to facilitate their getting out the seeds from the heads. Such birds are not numerous.

The flowers of the Sunflower appear in succession during a considerable period, and produce a rich repast for bees, as the flowers afford considerable supplies of honey and wax; the honey is much superior in point of quality and quantity from the flowers of the Helianthus than from any other flowers, such as the Trifoliums, Polygonums, Heaths, or any of the Labiatae plants.

He found by various experiments upon the Helianthus Annuus, that a plant three feet high transpired in a day 1 lb. 14 oz. avoirdupois, that the quantity of transpiration in the same plant was proportional to the surface of the leaves; and when he cut the leaves off the stalk the transpiration ceased, and in twenty-four hours the plant withered and died. By these observations he considers that the

leaves are the organs of transpiration; and he found that transpiration was nearly confined to the day, very little taking place during night.

The leaves of the same plant perform very different operations at different times; during the day they are giving out moisture and absorbing carbonic acid gas, and emitting oxygen gas; during night, on the contrary, the leaves are absorbing oxygen gas. The leaves not only absorb carbonic acid gas and oxygen gas, but water also.

The name of the Sunflower originated from the resemblance which its broad golden disc and ray bear to the sun, and is rendered further appropriate by its having the power (which, indeed, other syngenesian plants possess) of constantly presenting its flowers to that luminary.

This order of plants is only endued in a very high degree with the same quality that is common to the whole vegetable world, that of presenting themselves to the light; though this property, where it is eminently conspicuous, has been construed into a sort of sympathy or perception in the plant, like the ancient heliotrope.

In the feeding of animals, the seed, being of a farinaceous oily quality, may be given as a cheap, substantial, and nourishing food for neat cattle, sheep, swine, and all sorts of poultry, and may be used either in the mealy state, or that of cake, after it has been expressed or manufactured into oil.

The large roots and naked stems, and some other waste parts, may in many places be converted into fuel. They may be made use of, in the billet or other forms for drying malt; and in some places may be converted into other ways as common fuel, and be substituted as chips for lighting of fires in the dried state near large towns.

The refuse of the plants may be employed as the foundation in littering of farm-yards, as well as for other purposes about them: such as wattled defences, divisions, screens, and temporary coverings for sheds. It may therefore be concluded, that this plant may now not only be cultivated for the purpose of ornament, but for a variety of economical uses and applications, as well as domestic purposes. It may also be found useful and beneficial with hemp in the cultivation and improvement of land of the fen and marsh kinds. When the Sunflower is grown three feet from plant to plant, in the intervals a crop of potatoes or beetroot may be obtained. Bread was made from the meal by Mr. King, Berners-street, in 1834.

Sunflower grown in different parts of the country by W. S.:—1830, Suffolk; 1834, Old Brompton, Middlesex; 1836, Spring Park,

Surrey; 1838, Waltham Cross, Hertfordshire. —*Specimens of the productions from the Sunflower.*

No. 1. HEMP, from the stalks of the plant, when bruised with mallets and steeped in water, the same way as flax or hemp, produces a strong fibre in the manufacture of packthread and bags.

No. 2. PAPER, from the heads of the plant. After the seed is taken out there remains a white, shining, silvery, fibrous substance, which is contained in a large proportion, for manufacturing into whitybrown paper.

No. 3. SYRUP, for medicinal purposes.

No. 4. The DYE, from the petals or blossoms of the plant after they are dried upon a hot iron furnace, produces a brilliant yellow material for dyeing woollen goods and silks, as the colours are found to stand the test of acids and alkalis, and for making tinctures in medicine.

No. 5. OIL-CAKE.—After the seed has been manufactured into oil, there remains a farinaceous oily cake, which may be made use of in feeding of bullocks, sheep, and swine; and the seed before it is crushed is found very excellent food for foreign and English birds and poultry.

No. 6. The OIL is superior to any other now in use for the following purposes:—In the manufacture of woollen goods; in the manufacture of soap and candles; for lubricating all sorts of machinery; burning in lamps; in the manufacture of blacking, where olive oil is now used; and for watch-makers, not freezing. It is tasteless, and free from scent.

No. 7. POTASH, made from the stalks of the Sunflower, is employed in the manufacture of glass and pasts, and with oil or fat in the manufacture of soap, and also used for a variety of other useful purposes. The properties of this potash are—silica, magnesia, lime, and alumina.

No. 8. GUM, RESIN, or BALSAM, extracted from the plant when three quarters grown, which will be found a most excellent varnish for carriages, in the arts, and for medicinal purposes.

No. 9. The green leaves of the Sunflower, when dried and bruised into powder, form excellent fodder for all kinds of cattle, particularly milch cows, as it may be given them to great advantage by mixing the powder with chaff or bran.

Another authority says:—We presume it is not generally known that this plant, which is so often regarded as worse than a useless cucumber of the ground, is cultivated extensively in some parts of the United States, and turned to a very valuable account in a variety of ways. We have before us a letter from a firm in the interior of Pennsylvania, which gives us some interesting facts, which we think worthy of publicity.

The oil derived from the Sunflower seed is pretty well known. Its excellence for fancy painting and druggist use, is said to be confirmed, and we are even told that it is equal, if not superior, to almond or olive-oil for table use. One acre of ground will produce from forty to fifty bushels of seed, sometimes much more. Good seed will produce a gallon of oil to the bushel, and the oil has been sold at 1 dol. 50 cents per gallon, when flaxseed-oil stood at ninety cents.

The refuse, after the oil is expressed, is said to be a valuable food for cattle.

The leaf is manufactured into cigars, of a mild, pleasant flavour, possessing, it is said, powerful pectoral properties, highly commended by physicians in many diseases of the chest. The leaves, properly cured, will bring from five to fifteen cents. per pound.

The stalk, when stripped of the leaf and seed, may be burnt, and a superior alkali made from the ashes.

The comb of the seed, or properly the filaments of the flower is excellent feed for cattle or hogs.

The Helianthus is cultivated in the vicinity of York, Pa.; and a gentleman in North Carolina, in 1839, cultivated one hundred acres.

#### LONDON GARDENS.

THERE is a prevailing notion with us that nothing contributes more to the ill success of London gardening than the nature of the soil, of the many into which we have set our feet, there has hardly been an exception to the bad quality of the earth, black, clammy, sour, ill conditioned stuff, more like the soil that has been for years in a pot than anything else. Leave a London garden untouched, and even weeds will not grow. Trench and heave up the soil from a depth, and they will grow even if you turn up brick rubbish. The cause then if we could discover it would suggest the remedy. The first inquiry then is in what does London differ from the country; and there are two very striking differences—the one is the want of a free air, and the other an overcharged atmosphere. The former is prevented by hundreds of thousands of buildings from thirty to sixty feet high crossing in all directions and preventing any thing like a free sweep of the winds along the face of the earth; and the other is occasioned by millions of chimneys vomiting forth their smoke, and changing the very nature of the air we breathe. It may be said that the wind is as strong in London as the country, and so it may be indeed in some cases stronger, but it is not such a wind as we experience in an open space blowing over the entire face of vegetation; it is a gusty eddying

wind, curling and driving in currents, and whirling about in hollows merely disturbing and stirring up the impaired atmosphere, and not driving it away as in an open space, and with regard to the effect of London smoke, there is little doubt but that it has been that of changing of the whole surface of the ground with enormous excess of soot which is constantly falling, and where it is allowed to remain undisturbed, it poisons every thing that has to draw its nourishment on the surface. The very rain water falls black on some occasions, and although it was said some months ago in a garden periodical, that London smoke was good for plants; we beg to aver that whatever theory may be preached on this subject, an excess of it, which is the fate of any thing within its influence is fatal. It is quite true that there may be seen shrubs and trees in the middle of London, which grow and have been growing for years; we happen to recollect that these shrubs and trees do not draw their nourishment from the surface, but are throwing out their roots and fibres much below the influence of that which poisons the surface. Yet even these are miserable objects in general, because their foliage is under the baneful influence, and can be seen healthy in no places but where they are syringed from time to time to wash off the accumulations. It has proved on several occasions within our knowledge, that turning over the ground frequently has had the best effect, and dressings of lime have done good service. On the borders of the Thames, vegetation is more free, and this cannot be because there is less smoke, for steam engines abound, but it is because the air is more free, the winds sweep uninterruptedly along the smooth surface of water, and the influence is beneficially experienced for some distance on each side, in the purity of the air which comes uninterruptedly along the water from distances hardly contemplated. Hence we have market gardens on the banks of the Thames almost close to London, as may be seen from the Greenwich rail-road actually adjoining the densely populated edge of town down the river, and the same above, that is to say near enough to the river to feel the influence of the free air and improved atmosphere.

#### A FEW NEW FLOWERS.

THE present season has produced several decided improvements upon last year's. It is a long time since we had to record the exhibition of a Pansy, that we would add to the present collection with advantage; we now have two which have received prizes.

PIZZERO, a yellow ground flower raised

by Mr. Thompson, of Iver, exhibited at the Heartsease Society, held at Mr. Lidgards, the Thatched House, Hammersmith, when there were, we should think, no less than forty seedlings; and where, looking at the fatal manner in which the award of prizes to inferior subjects misleads the public, they very properly only give one, and it was to this flower. It is as good as, but unlike Eclipse.

**NE PLUS ULTRA**, a yellow ground flower, raised by Mr. Buxton, of Wandsworth, the ground is good, the general form good, colour very dark, and its principal fault roughness of edge. We saw this at the South London Show, whether it got a prize or not is not of the smallest consequence to the owner, as it could not in that society tell for or against the flower, we shall no doubt see many others this season, but these are safe flowers.

**DULCIFER**, raised by Cook, a white ground and very promising flower, with bright blue border, has not been shown this season yet, though it was the only star of the last.

**CALCEOLARIAS**, here made a stride in advance; *Lady Constable* was the favourite last year, and any that regularly pass by that, either in size, form or colour, may be safely added to a collection, while, those which equal it, and are of other distinct colours may be tolerated. Of these we have seen this season; the most remarkable have been sent anonymously, and cannot therefore be identified. Mr. Heale, of Devizes, has raised half a dozen worth sending out. Mr. Kinghorni of Twickenham, showed four at the Horticultural Gardens all rather in the way of *Lady Constable*, but better; these were named Professor Wilson, Kinghorni, Lady Anne Charteris, and Duchess of Sutherland. We have seen one nearly a scarlet, very large and showy, but we are ignorant of who it belonged to, and it is enough to make one refuse to notice any that cannot be identified by the owner's name, and a name for the flower. Mr. May, of Leminglane, Bedale, Yorkshire, is letting out a great variety of *Calceolarias* of various sizes and colours, some very large, some of curious shapes, but none of them remarkable for approximation to our standard. One called *Lady Walsingham* is very large and a pure yellow.

**TULIP**.—Mr. Hepworth, of Brighouse, has a new *Byblomen Tulip*, which is an acquisition, if it will only come half as good as the specimen sent up to town, of which we had a sight. It is remarkably clear, finely feathered, rather long cupped, but too good to be lost sight of, and is at any rate a star in a bed.

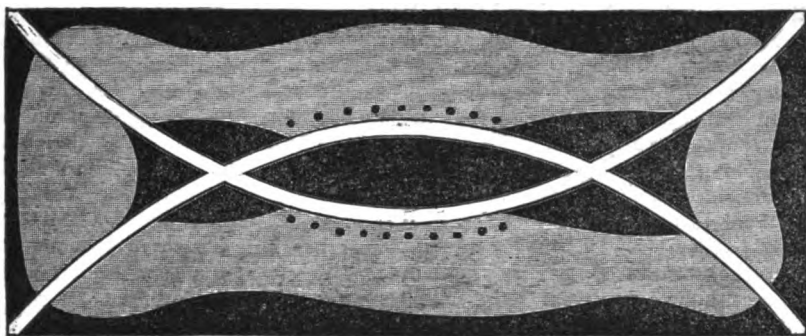
**POLYANTHUS**.—Mr. Burnard has exhibited a promising seedling, scarcely bloomed enough to decide upon absolutely, but it was very

prettily laced, fine dark colour, well defined, and apparently robust habit. Mr. Ivory exhibited two at the same time, new in the metropolis, and very showy, good trusses, good colour, but the lacing not so even and perfect as Mr. Burnard's.

**AURICULAS** have moved, but their movements are slow. Mr. Thorpe of Wadworth has a white edged flower, which, as times go, is worth a place among the best. We are short of this class of flowers, and though not without fault, it is far better than most of the present ones. We should never think of showing a white edged *Auricula*, except Taylor's *Glory*, for Popplewell's *Conqueror* and *Pillar of Beauty*, which next best rank in the metropolis of London are behind this: it is called *Magpye*, perhaps because it is a splendid black and white, and the colour well divided. Mr. Dickson's *Auriculas* keep their ground, and he has shown one or two new ones which are rather promising.

We ought to be able to report on at least a dozen *Geraniums*, and twice as many *Calceolarias*, several *Panseys*, *Cinerarias*, *Tulips*, and *Auriculas*, but the silly habit of sending them without the names of the owners or of the flowers, totally prevents our identifying them. We, therefore, strongly recommend the owners of new subjects to send in confidence their own names, as well as the initials by which they would like to be addressed in the notices to correspondents. It has been thought by some that these notices are rather ephemeral in their nature, because in a season or two the best of these flowers may be superseded by better ones; we think it will be always interesting to turn back to them even when the subjects are thrown by altogether; but we think also, that they will not be so soon done with as some of our readers imagine. It has taken, and will still take, some years to displace the *Dahlia Springfield Rival*, or the *Pansy Eclipse*.

The *Auricula Unique*, and many other flowers were at first only noticed as we are noticing these, and we shall endeavour to make our reports on seedlings as complete as possible. Our description of the *Dahlias* for 1844, has been acted upon so generally that the numbers sold of each are in exact proportion to the character we gave them. The three best being *Lady Antrobus*, the *Standard of Perfection*, and *Sir J. Stewart Richardson*; *Lady St. Maur* stands next in point of numbers, but *Essex Bridge*, and *Leander* have been withdrawn altogether, because the owners could not raise a fifth of the number of plants ordered, and they considered this flower good enough to stand out against all the novelties of the next year.



### LANDSCAPE GARDENING.

THE thousands of narrow slips which are now being laid out all round every town in the kingdom, induce us to continue giving sketches, which are more or less adapted for gardens at the backs of houses in rows. In the above sketch there is a little uniformity, and not much plan: the boundary is to be planted to hide the wall, the centre clumps about the paths where they cross are adapted for low choice shrubs. Standard Roses, or other single specimens are on the outside of

the patch, and the light portion as before is meant for grass, we like it less than any we have, but there must be some of that to be some of all sorts, and it happens to please the fancy of the party it is done for. The ends of the path nearest to the dwelling are entrances to the garden, while each of the other ends should terminate with summer houses, temples, or other appropriate ornaments or erections, calculated to please the eye and be useful.

### GLENNY ON THE DAHLIA.

THE following is the substance of some remarks made at Norwich previous to a show, they were addressed to a large meeting of exhibitors to guide them in putting up their flowers:—

After a brief introduction, Mr. Glenny alluded to the manner in which growers were deceived by new sorts, which were put forth as flowers of the most splendid habits and beauty of form by the nurserymen, who were constantly advertising—he would not say intentionally to deceive, but perhaps by many from ignorance of what qualities the Dahlia ought to possess. He had long seen the necessity of adopting a system upon which all might agree, and he felt confident that where it was understood, an evident improvement would be experienced in the cultivation and properties of this flower. To these qualities Mr. Glenny then directed their attention.

Form was the principal property, which was divided into four essential points. When looked at in front, a flower should be a perfect circle in the outline; when sideways, its form should be two-thirds of a circle; the centre should be perfect, that is, the petals should be full and cover each other in such a manner as to present a degree of doubleness, similar to that of a ranunculus—in fact, the nearer the form of a Dahlia approached to that flower the better. Colour must always be a

matter of taste, and therefore should not be taken into consideration until after the form was determined. Size was held the least important of all, because if the bloom was of a showable size (any thing from 3½ to 4 or 5 inches), that point would not be counted unless the competitors came so near as to render it necessary. The sinking of the eye was the least objectionable fault, supposing the centre to be perfect in other respects. Petals too much quilled, pointed, or notched, must be avoided.

Mr. Glenny then exemplified by the flowers these various points, and having perfectly satisfied many enquiries, proceeded to the question of judging of Dahlias by stands.

"I have no hesitation in affirming," said Mr. G., "that the whole mischief has proceeded from a total absence of system and principle in the award of prizes; a perfect absence of rule or guide in the estimate of productions, and consequently a total ignorance on the part of the exhibitors of what would best please the judges. A man, therefore, who, to simplify the explanation, we will suppose is about to show a stand of Dahlias, does not know whether to put up all large flowers, or small flowers, or bright flowers, and though able to please any taste, is more likely to put up the wrong than the right.

"The properties of the Dahlia I presume to

be admitted as they have been already stated. But there are one or two properties in a stand which cannot be found in single flowers—*contrast*, which gives brilliancy, and *uniformity* of size and arrangement. I recommend, that before any of the properties are examined, the judges walk along the whole number of stands, and take particular notice of those blemishes, which are held to condemn them altogether, and to get rid of a number at once. For instance, push back all the stands which contain any flower that shows an eye, that is, the yellow disc or the green scale, or that has a mutilated petal, or two flowers alike—no matter about being the same—or any other blemish that would condemn a single flower. This is often objected to where the rest of the flowers in a stand are remarkably fine; but it should be recollected always, that as there are to be a certain number of flowers shown, and the blemish that would condemn a flower takes one from the stand, there is no longer the number required. Besides, the fact of such a flower being disqualified is already known to all exhibiting, and while others show under a disadvantage, because they avoid all these things, there can be no excuse for any one to set up flowers against the rule. It is the last three or four flowers that puzzle us when we set up twenty-four blooms, and nineteen times out of twenty we could put up the last as fine as the first, in all but the blemish that would condemn it. The stands being thus reduced by all that are thrown out, may be next reduced still further, by putting down all that have flowers which may be called stale, or with pointed petals, or notched petals, and the remainder may be thus estimated:—The stands should be numbered, and if they be not numbered when sent in, the judges may put the letters A, B, C, D, and so on through the whole. They may then commence a stand, by counting the flowers that are perfectly round in front; next, the number that are full up in the middle, or as I have described it, rounding when looked at sideways; then the number that have perfect eyes; next, the number that have a full quantity of petals, or have the property of doubleness; then comes the property of brilliance (which is best estimated by counting the number of distinct colours;) uniformity of size; and uniformity of arrangement. I have described these properties fully in speaking of single blooms. I will suppose the stand marked A contains sixteen flowers that are round in front, twelve that are well up in the middle, eighteen that have perfect eyes, sixteen that are double, close, and compact, and eleven distinct colours or shades of colour. This will give the stand seventy-three good points; and though this may seem troublesome, it is very quickly done; because,

as only one property is examined at a time, it is rapidly seen. Uniformity of arrangement consists in placing the colours so that the stand shall look harmonious; and this is best done by beginning the arrangement on the outside. If a light flower be put at the corner, let the other three corners also have light flowers; if the next be also light, which will put two light flowers at a corner, let there be a second put at the other three corners; a dark one (or two dark ones together) comes next—but do the same at all the places. In the middle row you have simply to do exactly contrary to the flowers above and below. If the corner flowers are light, the end of the middle row would be dark, and so all through the rows. The following would be specimens of uniform arrangement, but of course it is better illustrated by the flowers themselves:—

x	x	o	x	x	o	x	x
o	o	x	o	o	x	o	o
x	x	o	x	x	o	x	x
<hr/>							
x	o	x	o	o	x	o	x
o	x	o	x	x	o	x	o
x	o	x	o	o	x	o	x
<hr/>							
x	x	x	o	o	x	x	x
o	o	o	x	x	o	o	o
x	x	x	o	o	x	x	x

And for any kind of really *uniform arrangement* I would give five points, and for the best and most perfect the maximum should be ten points. For uniformity of size five more points, and none to those which are deficient in this particular; add the numbers up, and place them accordingly, but if any two are very nearly alike, that is within five of each other, look to size. It is perhaps necessary to state that uniformity of size does not mean all of a size, but all in the row of the same size. A stand with the back row large, the middle row somewhat less, and the front still less, is quite as good as all of a size, so that there be no difference in each row. If I have made myself understood, the judges who act upon the plan will find judging at once easy and satisfactory."

#### PILLARS AND FESTOONS OF ROSES.

Few plants supply the great variety of habit, colour, and size, which the Rose may boast. Hence they may be grown in imitation baskets, for which the dwarfs may be used, or on pillars, when the rapidly growing varieties may be used, or in festoons from pole to pole, or on the fronts of houses, walls, and trellises, for which climbers are appropriate. Mr. Godwin, of Market Drayton, who took great de-



light in the various application of climbers thus describes his fancy and the mode of indulging it:—

Having been an admirer as well as a considerable grower of the Rose for some years, I venture to give the result of my observations. No flower has approached nearer perfection in the number and extraordinary beauty of its varieties than has this queen of flowers; its easy culture, inimitable fragrance, and universal adaptation, render it a general and deserved favourite with the prince as well as the peasant.

No object can be more attractive, or form a finer feature in a flower garden or a well-kept lawn, than a pillary of Roses judiciously introduced. From the middle of November until Christmas I find the best time to plant these and all other kinds of hardy garden Roses, where the soil is not too wet, or situation too exposed. Where, however, the latter is the case, and the soil of a retentive nature, the better time to plant them will be found the middle of April, and not February, as is generally recommended; as I have discovered, from many years' observation, that they generally suffer more during the month of March, than from the combined effects of the preceding winter. They also do much better when planted singly to a pillar than introducing two or more varieties. It will be found exceedingly difficult in that case to get them to assimilate in growth, so as to prevent one from destroying, or, at all events, materially injuring the other.

The following kinds planted in rotation as below, either to form an avenue, or to encircle a rosery, will be found perfectly hardy, grow with the greatest vigour, and present a graceful mass of foliage and flowers, which it is more easy to conceive than describe:—Rose Angle, Ruga, Crimson Boursault, Felicite Perpetuelle, Indica Major, Brunonii, Princess Louise, Boursault Gracilis, Adelaide d'Orleans, Boursault Elegans, Madame d'Arblay, Myrianthes.

Where temples of Roses are required, and the shoots long to festoon from pillar to pillar, the following will be found most eligible, having long flexible shoots and sub-evergreen foliage:—Alice Gray, Ruga, Dundee Rambler, Jessica, Queen of the Belgians, Ayrshire Splendens, the Garland, Drummond's Thornless, Felicite Perpetuelle, Rampant, Brunonii, Rose Angle.

Where pillars are required only about eight to ten feet, the following answer admirably:—Laura Dareaust, Boursault Elegans, Brennus, (grafted) Crimson Boursault, Watts's Climbing Provence, Princess Louise, Russelliana, Noisette Jaune Desprez, (grafted) Bour-

sault Inermis, Noisette, Laliche, Fellenberg, ditto, Aimee Vibert, ditto.

It is scarcely necessary to say that, to ensure success, the ground should be well trenched, and made particularly rich by the addition of a thorough dressing of well-rotted manure. With this attention, and strong plants, they will reach the top of the pillars the second, and not unfrequently the first season after planting. We have the above kinds growing with us, varying in height from six to twenty feet, simply supported by larch poles, which are easily procurable at about sixpence each, from fifteen to twenty feet long, and, when previously subjected to the action of fire for about three feet at the bottom of each, will stand a number of years without further trouble than the annual dressing of the Roses.

We have seen many pretty specimens of these climbing Roses at the garden of Mr. Jenkinson, at Kingston, and of the festoon's plan, at Mr. Stewart's nursery, Salt-hill, where in the season the different varieties form beautiful objects along the nursery by the road-side.

#### PROPAGATION BY PIPINGS AND CUTTINGS.

SOME gardeners and florists are in the habit of striking their Pink cuttings, or pipings as they are called, by reducing the cutting to the top-most joint, and cutting away all the leaves close above the central bud; they are afterwards planted in sand, on the top of a rich compost, and covered with a hand-glass. Any similar plant may be struck in the same way; it is like striking vines by the eyes, and is most apt to succeed in sunny weather, as it depends on excitement; and though it has not leaves to nourish it, as a large cutting has, yet it strikes root sooner, and in dry sunny weather is not so apt to fail as cuttings, which suit dull cloudy weather best.

In Propagation by Cuttings, the treatment depends greatly on the manner in which they are formed, and the state of the weather; if it be dull and cloudy, they will succeed best with their leaves on, and will require more air; if dry and sunny, they must be kept shut up from the air, and more divested of leaves: a cutting with few leaves, and these cut, is similar to an eye, and requires excitement or stimulus, that with leaves will perish if much excited. Bell-glasses are useful in preventing too much evaporation; if the frame or hand-glass can be kept very close, there is less need for them, but they are always good. A great deal of the success of Cuttings depends upon their being well pressed by the medium in which they are inserted; they can be best

squeezed to the sides of the pot, and are found to succeed best when pressed against it; clear silver sand being the medium which consolidates most readily after watering, and presses most closely to the sides and ends of the cutting, allowing the water to pass freely, is therefore the best. The cuttings suffer most from evaporation by heat, when newly made, and must be shaded if the sun is strong; but, if kept close, the evaporation is not so much, and there is less need of shade: the more heat they can stand, without risk of perishing, the sooner they will root; and when cuttings have been hardened by standing for some time, and appear difficult to strike, and not apt to perish by evaporation, they should be moved into a greater heat, which will cause them to strike sooner. So also will bottom heat promote striking when the cutting itself is comparatively cool. Pink pipings will strike in a few days, if the bed in which they are struck is formed on a foot of good hot dung. As to the time of making cuttings, when the young branch is in the act of extending by growth, the living principle is more active, the swelling of cellular matter that precedes roots is sooner formed; and often a plant will be found to strike from a young shoot, with its base or collar wholly separated from the stem, when a ripened branch will not succeed: but they are more apt to die, and die more quickly (short little shoots, not far sprung, are least apt to die), but the living principle is more active, and, if kept close, evaporation is not so great, and some plants will strike in this way that will not by cuttings of the ripened wood. It is of great consequence with all cuttings, where the young branches are short, and will admit of it, to preserve the base or collar of the shoot; there is a nucleus of buds and fibres formed in the swelling at that place, from which roots are more easily produced, though they will do so at times from the fibres protruding between the joints. The foregoing is a sort of rambling notion of an everyday operation, upon which everybody can say something, but it is more in the way of accounting for the effects than in the practice that men differ.—B. B.

#### RAISING CONIFEROUS PLANTS FROM SEED.

*Abridged from a Paper read at the Horticultural Society.*

**SEEDLING** Pines, especially those belonging to the section of *Pinus* proper, are extremely subject to damping off, just above the ground, shortly after they have come up, and generally when they are about four or five days old, more particularly if it is wet weather at the time; and it then frequently happens that not a

single plant is saved, although every seed should have vegetated. I fully tried the effect of sowing the seeds in various mixtures of peat, sand, and loam, mixed in various proportions, from nearly all sand to nearly all peat, or loam as well as sand, loam and peat, separately, and also leaf mould, a soil strongly recommended by some, but in all respects as bad as peat itself. Different depths too were tried, from laying the seeds on the surface of the earth, to covering them three-fourths of an inch deep; the pots or pans in which the seeds were sown, were placed in various temperatures, from the open air to the hotbed; some of them were even placed over the hot flue, some were covered with a bell-glass, others were left exposed. The system hereafter detailed is the only certain and sure one for Coniferæ of all kinds; I should, however, mention, that there are some species which succeed tolerably well under other modes of management, particularly if sown in the open air, and when the seeds are fresh. These are more especially species of *Picea*, *Abies*, *Larix*, and *Cedrus*, as well as of *Juniperus*, *Cupressus*, and *Thuja*; but they must be sown as early as possible in the spring or summer, for if sown in the autumn or winter they also are subject to damp off, particularly if any artificial heat is used: a thing absolutely necessary if the seeds are sown in winter, or have been long gathered, or damaged by being overheated on the journey.

In the autumn of 1838, the Society purchased, from Mr. Charlwood, some seeds of *Abies Cephalonica*, which had been heated by being sent over in a close cask, perhaps also by having been packed in a green state, and by the cask having been stowed away in the close hold of the ship. When the seeds were sent to those who had ordered them, they were declared to be dead; one gardener threw behind the fire the seeds which his master had purchased; and even some nurserymen would not sow the seeds, but returned them, believing it useless to attempt to raise them. I must confess, that I myself considered their appearance very unpromising, but having before found other Fir seeds looking equally ill, which nevertheless vegetated, I gave these a fair trial, and with a little care, succeeded in raising about five hundred healthy plants. The seeds were sown in pans filled with loam only, and were covered nearly half an inch deep; care was taken that the loam was pretty dry when the seeds were sown, and little water was given until after they began to vegetate.

If Fir seeds are sown late in the autumn, in winter, or early in the spring, the pans, or pots should be placed over the flue of the hothouse, or other place, where there is a strong dry heat, which is not too violent; but if they are sown

late in the spring, or in summer, they may be placed in a much cooler place; still great care must be taken that, directly vegetation commences over the hot flue, the seed pans are removed to a much cooler place, where there is plenty of light and air to harden the seedlings by degrees; water must still be given sparingly, and, finally, they may be removed to a cold pit, where they can be kept free from frost the first winter. As damp is particularly prejudicial to them, they should be exposed to the open air every fine day, and when large enough, they may be potted off into small pots; no peat should on any account be employed in the mixture in which they are potted, but if the loam is stiff, a little sand may be used, not much, however, for I find if there is much sand in the compost the plants become weakly.

In conclusion, the rules I have to recommend, are the following:—

1. Always to sow the seeds directly they are received, whether in midwinter, or midsummer, or any other time of the year.

2. Always to sow the seeds in pure loam, not to use the least particle of peat, and as little sand as possible.

3. Always to sow the seeds in dry loam; to give very little water until the seeds are fairly up, and then only sparingly.

4. To cause the seeds to vegetate as quickly as possible after sowing, more particularly if the seeds are old or damaged, taking great care, however, that, before they are fairly above ground, they are removed to a much cooler place, where there is plenty of light and air, and they can be secured from frost.

5. Not to let the young seedlings remain very long in the seed pots before they are potted off, and to give plenty of air to them after they are potted, with as little artificial heat as possible.

6. Always to plant them out in the open ground after the second year. If Pines are kept any length of time in pots, especially if not regularly shifted twice a year, their roots become pot-bound, and as they are a race of plants which make few roots, and those always near the surface of the ground, they are almost sure, if confined many years in pots, to be blown over or to one side, and when this has once happened they hardly ever become firm, or make handsome trees.—[A Mr. Gordon was the author of the paper.]

#### THE VALLISENARIA, OR PLANT OF THE RHONE.

THIS plant consists of a small root, with a few long leaves arising from it, and in the midst of them a stalk of two or three feet in length, but so weak that it is by no means

able to support itself erect. On the top of each stalk is one single flower, in some degree resembling a single flower from a bunch of jasmine. It appears to be the purpose of nature, and it is absolutely necessary to the well-being of the plant, that every part of it should be immersed in water, except just the flower at the top of each stalk. But these flowers must always be kept above the water; and the heat of the sun is requisite to the opening of the seeds contained in the base of them. The Rhone, in that part of it where this plant grows in greatest abundance, is a river of very uncertain depth, and that in places very near to each other. If the seeds of this plant, or the side-shoots from the roots, produce new ones at different depths, how is the flower to be carried to the top, and only just to the top of the water in each case? The Rhone is also, of all rivers, the most apt to be swelled by sudden floods; in this case, how is the plant that was just flowering in its proper manner, at four feet depth, to be kept in the necessary state of having that flower above the water, when the depth is increased to six; or how is it to be kept from falling on the surface of the water, and rotting, when the water decreases, and leaves a foot or two of naked stalk, which is unable to support itself? All this is provided for by a benevolent Providence, who has made the stalk which supports the flower of this plant of such a form and texture, that it at all times suits itself to the depth of water it is in; for the stalks are not straight, but twisted in the manner of a corkscrew, or rather in the form of those springs of wire which we see made by wrapping wire round a small stick. By this formation the stalks of the *vallisneria* have a power of extending and contracting themselves in length, and this so suddenly, that let the rise or fall of the water be ever so quick, the lengthening or shortening of the stalks accompanies it; and the same formation suits them in a still easier manner to the different depths of the river. No other plant has a similar adaptation, and by this means the flower is kept just at the surface of the water and the sun has power to ripen the flower till the seeds are scattered on the water when perfectly ripe, and where they remain till they are completely wetted, when they sink, and take root at the bottom of the river.—*Burt's Observations on the Curiosities of Nature.*

#### VARIOUS MODES OF GROWING THE POTATO.

WE verily believe there are as many ways of cultivating the Potato as Ude finds recipes for cooking them, and that is about five hundred. Yet these various modes of growing them have

been adopted from time to time to meet circumstances under which the growers have sometimes found themselves, and are, therefore as well to be known, because a man may often be in a position to adopt one method, when he could not so conveniently go to work another way. The following method has been practised in the neighbourhood of Weston-super-Mare, Somerset, with much success:—Plough a field as if for sowing wheat, or dig a bed of any length, four feet wide, and a foot and a half deep; scatter moist manure over the whole, and place four sound Potatoes of a middle size across the bed in rows two feet apart; each potato must have its useless eye at the bottom cut out to expedite its decay, and consequently to quicken the growth of the stems. Earth taken from the alleys should then be spread as fine and loose as possible on the bed to the depth of three inches only; more earth to the depth of three inches must be added after a heavy fall of rain to secure the moisture. If this second covering be given just as the plants are breaking ground, it will protect them greatly for a time, and strengthen the roots in case of frost. The bed may be a little higher at the sides and ends than in the centre, that not a drop of rain may fall off. When the blossom buds appear, the stems bearing them have grown to their full length; they should therefore be cut down to within a foot and a half of the ground to stop and force down the sap, and thus quicken the growth, and consequently the ripening of the young Potatoes; no other parts are to be removed as they are raising sap for the benefit of the crop; the weeds should be Dutch-hoed once, by a person standing in the alley, which loosening of the earth will cause the air and rain to reach the roots, and the sun to ripen the new Potatoes. Thus, if an over dry season should succeed, the roots will receive sufficient moisture; the loose flat surface will imbibe every drop of rain, and give space for the growth of the young Potatoes. If an over-wet season follow, the alleys and the loose earth below the roots will receive and absorb the superfluous moisture. Early Potatoes may be planted throughout the year, provided they are protected from the severest frost, harsh winds, and superfluous moisture; and this it is presumed may be accomplished by either of the three following modes:—Let a moveable frame be made of any length, four feet wide, and having a cross board at each end; the back plank should be two feet nine inches, and the front one two feet wide, and the wood one and a half inch thick; dove-tailed cross bars must be placed four feet apart in this main frame to receive top frames four feet wide, and four feet and four inches long; the joints of all the frames must be ploughed and tongued together, as a

security from the severest frost; ledgers must be placed across the joints in the main frame three feet apart, and well nailed. Let all the top frames be close boarded, and one inch in thickness. Or let three pieces of wood or bars, equi-distant, be well mortised and tenanted together on the top frames, upon which the stoutest canvass should be strained and tacked, and thickly besmeared with tar paint.\* Or, instead of the strained canvass, a thick thatching of reed or unthrashed straw may be substituted. The frames must receive two or three coats of blue or dark green paint to preserve the wood, and to render the joints air-tight. The main frame can be quickly taken to pieces and removed at pleasure. The top frames should be raised daily at every opportunity, and in a small degree at nights also when frost is not apprehended; and if they were wholly raised for ten minutes during a heavy fall of snow it might not be amiss. The earth between the planks ought to be well digged and manured before any planting or sowing takes place. Four early Potatoes may be planted in rows two feet apart with their roots, if any have sprouted from their having been previously spread on a wooden or earthen floor, and covered with a damp woollen cloth, or from their having been placed in a damp cellar, or other damp place, secure from frost. Earth taken from the alleys outside the planks must be spread evenly and loosely upon the bed to the depth of four inches only, and no earthing up is to take place; salmon-coloured radishes then be sown to come off in due time. In April or May the produce will be thoroughly ripe, and may be wholly disposed of; for if the roots† are instantly planted in prepared ground close at hand, and well watered, they will strike immediately, and produce a crop in July or August for seed, which must be kept in the open air upon hurdles, or mats, or gravel walks, for three or four weeks, to harden; these roots may also be immediately planted and protected from the weather, but they must not be exposed to the air beyond a few minutes, or they will not strike. In April the top frames may be wholly removed into a shed or barn to be protected from a scorching sun until Potato planting again; and should a frosty night intervene, the icicles must be removed from the Potato plants by brushing them with a heath, fern, rush, or other very light broom, or by forcing them off with a garden engine, or through the spout of a large watering pot, before the sun can dissolve them. The space within the main frame may be sown in compartments with the seeds of vegetables and flowers, and covered with a

\* Whitney's composition was not known at that time.

† Does not the writer mean the haulm?

small meshed net, and over it occasionally with a cheese cloth, as a protection from a scorching sun, until early Potato planting again.—H. B.

### THE PEACH TREE AT OULTON PARK.

*Abridged from a Paper read before the Horticultural Society.*

I HEREWITH send an account of the extraordinary Peach tree at Oulton Park, the seat of Sir P. De M. Grey Egerton, Bart., for the produce of which the Horticultural Society of London was pleased to award four medals, in four successive years.

The tree in question is of the Noblesse kind; the house is metallic, it has an angle of fifty degrees, with an upright front sash of three feet from the ground level, and was completed by the 1st of January, 1832. It is thirty feet long by twelve wide, is furnished with one trellis only, which runs parallel with the roof at the distance of fourteen inches, excepting the base of the trellis, which meets the ground at thirty-six inches from the front lights, thus allowing a front walk to give air, &c. The front wall is on arches, and the tree planted inside, consequently it has roots both inside and outside. It is heated in common with two other metallic houses by one boiler. The roof glazing is done in the curvilinear way, the laps being leaded with a hole in the centre of the curve for the escape of condensed steam. The border for the Peach was excavated to the depth of forty-two inches, and the width of twenty-one feet; the subsoil, a clean red sand, presented an inclined surface of nearly one inch to a foot.

After laying a complete system of drainage, the whole surface was covered one foot in depth with old bricks and stones; on this was laid three inches of lime rubbish, out of which all small particles had been carefully sifted. The lime rubbish being formed to an even surface, was covered entirely over with thin turfs of heath soil, cut about a foot square, and placed horizontally, barely touching each other; and finally a sprinkling of small gravel stones was swept into all the crevices; the whole was now covered to the depth of twenty-four inches with a compost as follows:—

Good maiden loam, fresh from an old pasture, half way between strong and light, of a yellow colour, 12; leaves from the park in a fresh state, 3; horse dung, 2; sharp sand, 1; bone waste, 2; these ingredients were of course thoroughly blended together.

The largest, cleanest, and best formed tree on the open walls was selected, and the roots, having been cut the year previous to check luxuriance, were of course in good condition for removal. The greatest care was taken during the process of removal, as to preserving

the roots free from wounds, &c., but no soil was left adhering to them; they were, however, kept continually wet until the tree was fixed in its proper situation. The tree was so large that it required ten men to carry it to the hole, and after having all the wood carefully strapped together in groups, it was lifted through the roof of the house, and thence lowered into its situation. The time of removal was the end of January, the pruning knife had been most severely applied to the young wood previous to removal, more especially as regards thinning, but the old wood was not interfered with.

The tree once placed in its situation, every fibre was of course as carefully trained as the shoots, taking care to carry a large portion of the superior roots through the front arches into the outside border. In the first week of February the tree was dressed all over with a mixture of soft soap, sulphur, and tobacco water, rubbed carefully into every crevice, and when perfectly dry, the wounds caused by pruning were coated over with thick paint.

Towards the middle of February the water was turned on the house, but the heat for the first fortnight did not exceed fifty degrees by day, and thirty-six by night. The house was steamed profusely morning and night all the season, with the exception of the flowering time, and during the ripening of the fruit. After the blossoms were set the heat was increased slowly, and for some weeks was about sixty degrees by day, maximum, and allowed to sink generally as low as thirty-eight degrees at night; indeed I have had it as low as thirty-four degrees at night, when the fruit were as large as peas, without any mischief whatever.

The tree ripened about eight dozen of very good Peaches in the same summer in which it was planted, and during that with the succeeding seven years, it has produced at least two thousand four hundred large and fine fruit; the largest Peach I ever gathered from this tree weighed twelve and a half ounces; I have, however, gathered hundreds of from nine ounces to eleven ounces in weight.

*General Management of the Peach Tree as practised at Oulton Park.*—I will begin with the root, and this leads me to remark that the Peach, in my opinion, as well as most other tender fruit trees, is planted in borders far too deep, as well as too rich. It is of course imperative on the planter to take the utmost care that no stagnation of any kind be permitted to take place, not only as regards drainage, but in choosing soil of a proper texture. A loam about half way between stiff and sandy, I find the best; and, in my opinion, the less manure is mixed with it the better, providing the loam be what is termed "Maiden Soil," from old rest land. If any manure be considered necessary,

it should be chiefly bone manure, on account of its decomposing very slowly, and of course gradually enriching the soil. It is by the wasteful and indiscreet use of dung that the Peach is forced to produce "Robbers," or over luxuriant wood, and if these robbers are not stopped with the finger and thumb, the true bearing wood is both robbed of its due share of sap, and prevented from attaining a due degree of ripeness. If Peach trees show any signs of weakness after bearing a few years in soil of the description I have recommended, the remedy is quite simple; it is only having recourse to top dressing, laying it on heavily in the winter and removing a portion in the spring; heavy top dressing is in my opinion extremely pernicious in the growing season. If this is not sufficient to renovate the tree, it is easy to add a prepared compost in a trench at the extremity of the roots. If any unnecessary luxuriance takes place in any of the fruit trees under my care, I cut the points of the roots without hesitation, taking care to reduce them in proportion to the degree of superfluous luxuriance. This root-cutting system I have pursued for seven years at least, and find it every thing that can be desired.

With regard to winter pruning, I am not aware that there is any thing peculiar in my practise, unless it be that I thin my young wood to a very great extent. This may alarm some persons, who may be afraid of not getting sufficient fruit, but this plan with a continual thinning and disbudding in summer, so as to lose no sunshine on the leaves of the shoots intended for the next year's crop, renders the buds so plump and well ripened, that there need be no fear in that respect.

After the winter pruning, I immediately stop every wound made by the knife, and every place whence proceeds gummy exudations, with a coat of thick white paint; this painting, if I may so term it, is repeated, and perhaps a third time, on all the larger wounds. This I have found of eminent use, for I believe it is a tolerable well-known fact, that the entrance of air and moisture into such wounds is in many cases the cause of premature decay. The wounds being dressed in this manner, I immediately stove the house with sulphur blended with sawdust and burnt in shallow pans, and afterwards dress the tree over two or three times with soft soap, sulphur and tobacco water, brushing it carefully into every bud and crevice with a painting brush; this mixture is not made so strong as recommended by some of our gardening authors, as I depend much on the careful brushing and flooding every part of the tree.

At the commencement of forcing, the same routine is pursued as before described, and I

may here remark on the evil effects of high temperature at night, for as I before observed I have had my thermometer as low as thirty-four degrees at night, when the fruit was as large as peas without any injury whatever. From the period that the fruit are beginning to swell off, until they commence ripening, my trees have most copious syringings and steamings, excepting that in the months of February or March, in cold dull weather, I am a little more niggardly of water, taking care especially that if I syringe in the afternoon, it be done early, so as to have the leaves dry by the evening; as a temperature of thirty-four degrees to forty degrees by night and a wet leaf would by no means agree. The house is of course fumigated twice or thrice, or in fact on the very first appearance of green fly. As for red spider, I seldom by this management see one.

The young wood through all the growing period receives the utmost attention; every robber is stopped with the finger and thumb as soon as about four eyes or buds long; every superfluous shoot that is not wanted for the next year's bearing, is taken away, and all the inferior shoots, which are much below the proper strength, are trained with the growing points as nearly perpendicular as possible, in order to decoy the sap into them.

As soon as I perceive the least change towards ripening in the fruit, I stop the points of all the young wood, with the exception of a few of the weakest shoots at the lower part of the tree, and these I keep growing until the end of the season, in order to get, as I before observed, as much sap in them as possible. In the course of their ripening, abundance of air is given both night and day, and *every leaf which shades the fruit is entirely removed.\** I need scarcely add that they cannot ripen too slowly; the slower they ripen if not absolutely starved the better. Syringing is of course withheld altogether, as well as the steaming; but as soon as the last fruit is gathered the tree is completely battered with water morning and evening, and the house shut up early in the afternoon with a thermometer of ninety to ninety-five degrees of sun-heat when it can be obtained, and this course is persisted in until the leaves turn colour, when the heat by sunshine is allowed to range even higher still; I have had it as high as a hundred degrees, at three to four o'clock in the afternoon. By these means the wood is most completely ripened, and in pruning cuts more like Oak than Peach wood. During all the ripening process the border inside the house is allowed to become very dry indeed;

\* This may not hurt, but we are quite sure it can do no good.—Ed.

in fact water is entirely withheld from the moment the least appearance of change in a single Peach is perceived towards ripening.

An opinion once prevailed very generally, that Peaches would not answer long under glass, unless the lights were removed during the rest season; this is, however, quite erroneous, as the lights have never been taken off the tree in question since it was planted.

Before I conclude I must just observe, that without cleanliness on the leaf and wood, no soil nor mode of training whatever can long answer for the Peach.

#### ON CANKER IN PEACH AND APPLE TREES.

Abridged from the *Quarterly Journal of Agriculture*, 1840.

FOUR years ago I had one of the best walls of peach and nectarine trees in the kingdom, which, for several years before that, was admired by every gardener and gentleman who saw it in the months of August or September, when scarcely a brick could be seen for healthy foliage and fruit; but the canker or gum committed sad destruction amongst the trees during the cold and moist summers of 1837 and 1838; so much so, that I thought it prudent to replant the upper part of the wall, the trees on which were nearly dead, and which were the most exposed to the north-east. The contrast between the roots and the tops of the trees as to healthiness was particularly remarkable, as the tops were nearly dead, and the roots were as healthy as any liquorice roots which were grown at Pontefract. I found the old border four feet deep, of excellent strong soil; but, as I deem it imprudent to make too good a border in a cold climate, I made the new border only two feet deep, with a rubble drain bottom. I planted it in March, 1839, with healthy trees, and they made a tolerable start; but, notwithstanding the prevention of plethora, the gum or canker was not prevented, for some of them suffered severely by it, the summer and autumn being cold and wet. This year they have done better, and a probable reason for it is, that we have had more light, more heat, and less wet. The first appearance of the disease in the peach is so very slight, that any person unacquainted with it would fancy that it was of no consequence, as the small brown circular spots which appear on the bark of the current year's shoots may be cut out with a sharp knife, and vegetation will go on as though no disease had ever existed; but let attention be diverted from them for a few days, and we will find that the spots have spread so rapidly as to surround the whole shoot, and that the circulation is stopped, and the branch dead. That soil possesses considerable influence over its products no sensible

man will doubt, but that it is the main cause of canker in the peach I presume the following particulars will shew the contrary. Last spring my employer requested me to convert an old pine-pit into a peach-house, and I planted an old Galande peach and an old Murrey nectarine in it, both which were intolerably affected with the canker or gum. I planted them merely to furnish the trellises with a few fruit until the young trees should establish themselves; in fact, I considered them as castaways; but now, the middle of October, the two old trees are furnished with most beautiful bearing wood without spot or blemish. I tried the above experiment merely to prove what I had frequently stated to my employer, that if he would cover the whole of his peach-wall with glass, the canker would disappear for ever. In this presumption I was not mistaken, as appears from the above experiment. I am aware that it might be urged against the conclusion drawn that it was owing to the old trees having been moved which caused them to grow less luxuriantly, and produce that kind of short-jointed bearing wood which is not so liable to be attacked by the disease; but I have a *patient* out of doors which will answer for itself, and which is worth a thousand theories. I re-planted an Elruge nectarine of considerable size out of doors at the same time I planted those in the peach-house; and during the very favourable spring of the present year, I was very much gratified to see both my young and old trees, as well as my patient, make a beautiful start; they, like teetotallers, seem to have forgot their old habits; but the sudden change, in the early part of June, from warm weather to comparatively cold, gave a check to vegetation, and my young and old trees, as well as my patient, shewed patches of the disease. Thus does it appear, in this locality at least, that a peach tree being ensconced under glass prevents the canker. As to a moist border having anything to do in causing the disease is quite out of the question here, as I dare venture to assert that the border had not been wet through from the time I planted the tree to the appearance of the disease. I am of opinion that a degree of cold is not the only cause of the disease; but that its severity aggravates the disease considerably; and this leads me to quote from the theory of G. W. Johnson, Esq., whether he states that "this disease commences with an enlargement of the vessels of the bark of a branch, or of the stem." I assert, however, that the enlargement of the bark is not the commencement of the disease, but is only an assurance that the disease has established itself some time previous to the enlargement, and that it is not the returning sap-vessels which are first diseased, but the concentric glands or pores

which are found in the bark (I mean those glands or pores which are supposed by T. A. Knight, Esq. to give character to wood), that are first affected by sudden changes of the weather; and that from the septic qualities of disorganised vegetable matter, decomposition or mortification commences, which thus deranging the functions of returning sap-vessels causes the enlargement. Therefore I cannot agree with Mr. Johnson when he makes a resemblance between the canker in trees, and any disease in the animal system arising from indigestion, &c.; but would rather compare it with those external diseases arising from too low a temperature, such as murrain in cattle, and frost-bitten noses in men, in both of which cases the circulation being stopped, speedy remedies must be resorted to, or mortification will destroy the very existence of the patients. I have here two Bedfordshire roundling-apple-trees planted within thirty yards of each other, both growing in a substratum of sandy roach, one of which is seriously affected with the canker, so much so that I thought nothing would do but decapitation, while the other tree is scarcely affected by it. Now, how is it that the one tree should be nearly dead with canker, while the other is in comparatively good health? The facts are, that I trim my trees punch-bowl shaped, and when those two trees were young they bore a good crop of fruit, which brought the branches of the cankered tree almost horizontal, and thus they have remained ever since, and it is these horizontal branches which are nearly dead with canker; from which I draw the following conclusions, that, as the scarcely affected tree is in a sheltered situation, with its branches in an almost erect position, the north-east wind had not cooled the bark below a given point, while the seriously affected tree being in an exposed situation, with its branches horizontal, it has had its system cooled down below a given point, and by that means the natural functions of the tree have been checked. Pruning no doubt has a tendency to prevent this disease in the apple arising from too low a temperature, as a branch that is surrounded with thick set short spines, acts as a shield to the more tender stem or branch. As to Mr. Johnson curing his russet apple-tree of canker by pruning it, it is quite as probable that milder seasons were the real doctor. Wherever an apple-tree is planted, and whenever the whole of its summer shoots are not ripened, it is owing to its being either too tender a kind for the situation, or the soil too good for the climate, or the climate a very bad one; and when all these evils combine it is not surprising should the tree die of canker. Formerly it appeared singular to me, when I

read the practice of various authors on the cure of canker in fruit-trees, that they always blamed the *subsoil*; yet the subsoil of every situation varies as much as the superincumbent soil. One blames cold clayey roach, while another blames sandy roach; a third does the same with clay, while a fourth blames the sand; and the prevention of the roots penetrating these various subsoils seems to be the panacea for all the cankered evils of these various situations; but it is not singular enough that the cankered matter should be found in every subsoil in the kingdom, or wherever a gardener chooses to stick in his spade? The mystery is solved at once when we come to consider the withering and penetrating power of the weather on spongy unripened wood. Canker proceeds also from cuts, bruises, and the attacks of insects; but all these produce insignificant effects compared with those of the atmosphere. It may appear difficult to reconcile the above theory with the canker in the larch. I say nay; for as there are times when the atmosphere hangs between deposition and evaporation—that is, a lurking atmosphere, which is neither cold enough to freeze nor warm enough to send off its superabundant moisture—it may be that this is the time in which the glands of the tender bark of unthinned or improperly thinned larches become affected. Hence those beautiful specimens of larch at Dunkeld and other places, which having been planted thin, the bark became thoroughly indurated, and able to withstand the effects of that lurking atmosphere which I have attempted to describe. Hence also, to avoid the canker in the larch, timely thinning may be advisable. so that every tree may support its own character.—*J. Pearson, Kinlet.*

#### NOTES AND COMMENTS.

**LARCH TREES.**—The Larch was considered by the ancients among the most valuable of the timber trees; particularly for the purpose of building, being almost imperishable, and less inflammable than any other wood. Pliny tells us, that the Larch was not found to decay in building like other pine timber; and that it burnt more like a stone than wood, never causing flame.—*Philips' Sylva Florifera.*

[Taking this into account with the extremely beautiful habit of the Larch, it should be more generally encouraged, there is not in the whole range of Conifera a more beautiful tree, the only drawback is, it is deciduous.]

**AN ORNAMENTAL RESERVOIR.**—Sir William Ouseley, in his "Travels in Persia," mentions a reservoir which he saw at Shiraz, and which must have presented a novel and



singular appearance. He says, "we rode in grand procession from the Takht-i-Cajar-Palace, and alighted at the house of Muham Zeki Khan; we were received by him at the gate, and conducted through a court crowded with servants and musketeers; here I remarked the singular appearance of a large reservoir containing water, the surface of which was entirely covered with various flowers, so as to resemble a fine carpet in brilliancy of tints, but the pattern was formal, as several floating rods or switches separated the flowers according to their colour, in distinct and regular compartments."

[Among all the plants grown on the water and in the water, there is not one that looks more gay than the *Mimulus*, which, if planted at the edge of a pond will spread like duckweed, the under side being all roots, and the upper all flower, on a bright green ground.]

**DESTROYERS OF SNAILS.**—The thrush is a bird of great utility in a garden where wall-fruit is grown, owing to the peculiar inclination which it has for feeding upon snails, and very many does he dislodge in the course of the day. When the female is sitting, the male bird seems particularly assiduous in seeking them out, and I believe he feeds his mate during that period, having frequently seen him flying to the nest with food long before the eggs were hatched; after this time the united labours of the pair destroy great numbers of these injurious creatures.—*Journal of a Naturalist*.

[We are inclined to think that the most mischievous bird does a good deal of good as well as harm, for we have killed a chaffinch, believing he was picking off the buds of a fruit-tree, and found a caterpillar in his mouth. From that time we tried to frighten birds, but not to kill them.]

**LANDSCAPE GARDENING.**—Far from wishing to be censorious, we state it as a remarkable fact, that not one gardener in a hundred is competent to design and execute the disposition of a garden in a manner worthy of the present or even antecedent ages. We would point to the natural formation of hill and dale, streamlet and waterfall, rocky and mountainous districts, and say—are there not in these, ample materials and bases for more exquisite and expressive creations of art than we are accustomed to witness in most of our artificial villa gardens?—*Mag. Bot.*

[Suppose we only point to the natural beauties of the spot itself, shall we not find half of them concealed by the introduction of stiff and formal planting, and ill contrived walks? There is hardly a garden in England that might not be greatly improved by grubbing up some trees, planting others, and altering the roads

without seeking waterfalls, mountains, and rocks.]

**FLOWER AND FRUIT TRADE IN THE ENVIRONS OF PARIS.**—M. Hericart de Thury affirms that on the 14th of August, 1839, £2000 worth of flowers were sold in Paris, and that in the depth of winter, certain grand *soirées* give rise to sales amounting to between 5000 and 20,000 francs. We may add, that bouquets of natural flowers are despatched, in tin boxes, not only to the remotest towns of France, but even to Munich, Vienna, and other distant foreign parts.

[There is evidently a growing taste in favour of cut flowers here, and the more it is encouraged the better; for there is not a more beautiful object in elegantly furnished rooms than vases of cut flowers.]

**TO PRESERVE CABBAGE FROM THE ATTACKS OF CATERPILLARS.**—In the *Economical Journal* of France, the following method of guarding cabbages from the depredations of caterpillars is stated to be infallible, perhaps, it may be equally serviceable against those which infest other vegetables. "Sow a belt of hemp-seed round the borders of the ground where the cabbages are planted, and, although the neighbourhood be infested with caterpillars, the space enclosed with the hemp will be perfectly free, and not one of these vermin will approach it."

[This, however efficacious, must depend a little on the space. Though we have not much faith in our French neighbours, it may be worth trying.]

**THE COSSU.**—The history of this invaluable and almost unknown plant is singular. It is the most valuable of all remedies for the tapeworm. In 1823, I passed through Paris, the French botanists had just given the name of *Brayer*, to an Abyssinian anthelminthick they extolled to the skies, and decreed all the honours of the academy to the discoverer, Dr. Brayer, of Constantinople. Three years after I had a letter from Dr. B., asking me to write to Abyssinia for a provision of the invaluable *Cossu*, and enclosing a treatise on its virtues. He had never been in Abyssinia. In the meantime Mr. Coffin arrived in Egypt from Abyssinia, and brought a quantity of it, which he prized as the apple of his eye. He gave me some ounces of it, part of which I gave to Dr. Ramage and others. Arriving in England, I found in Bruce an accurate description and drawing of this plant, there called *Cossu*, or *Banquesia Abyssinica*, after Sir Joseph Banks. The flowers only are used in medicine. The dose is an infusion of three or four drachms in a pint of boiling water. Of all remedies for worms this is the only specific. The tree grows to the height of twenty feet, the leaf

about four inches long. The flower consists of five petals, short pistil and stamina.—*Mad-den's Travels through Palestine, Nubia, &c.*

[This seems on better authority than the foregoing, and is acknowledged among medical men.]

**VARIETIES OF ASPARAGUS.**—I have grown the Battersea, which is tinted a little red at the tips, and is a good "grass," as we call it: next, the Gravesend, which is described as a greener-topped variety; and lastly the Giant. I made up a bed with one-third of each, that is, two rows twenty-four feet long; eight feet of the bed was made with each; at first the Giant came larger and stronger than the other two, but I have cut all of them three years running, and the difference now is very trifling; indeed some people would hardly discover it. The other two come nearly as large. My rows were eighteen inches apart, and a foot from the side of the bed when earthed up. The soil is light, rich, sandy loam, and the top dressing always nothing but leaf mould.

[There is clearly more difference in the culture than in the sort. We have it is true seen the purple top and green top very different in appearance, but we have had both from sowing the berries; with regard to the Giant, we have seen that dwindle much by carelessness, and the others brought of the giant size by culture.]

**PANSIES.**—It is a strange thing that, of all the Heartsease shown at Chiswick, there was but one which possessed the first and best of all properties, form and a smooth edge: its name did not transpire, but it was in a beautiful collection of thirty, shown by Mr. Edmunds; a sort of chocolate colour, velvety thick petal, and no great things of an eye, but it is one to seed from, and would bring a good race of flowers.—*Gardeners' Gazette*, 1840.

[It is still more strange that this variety which was mulberry superb, is still one of the best, if not the best self. It would be useful in a very small stand.]

**HOW TO EAT STRAWBERRIES.**—Most of our readers know how to grow Strawberries, and many have doubtless seen them served up with cream and sugar, but give us the Italian dressing for a Strawberry before all others. It makes a splendid dish in a dessert, and is sure to please nine out of every ten persons at table. The operation is simple. Take off the stalks from as many berries as will form one layer at the bottom of a dish; sift some fine loaf-sugar over them; then place another layer, and sift again; each layer will be found smaller than the preceding. When there are five or six layers, cut a fresh lemon and squeeze the juice all over them. Before they are helped, let them be gently disturbed, that they may all have the

benefit of the lemon-juice and sugar. They may be eaten of heartily without danger, which is more than can be said of strawberries and cream; and, generally speaking, those who have eaten them with the Italian dressing, will never eat them any other way, if they can help it.—*Glenny*, 1840.

[The *Globe* newspaper contained an article in which the writer wanted sadly to persuade the public that the squeeze of lemon (which gives an admirable flavour while it seems to strengthen that of the Strawberry) made the fruit unwholesome. The thing however was laughed at, and thousands are eaten so now.]

**STRIKING DAHLIAS IN WATER.**—I procured a hyacinth glass, and placed a strong cutting of the Marquis of Lothian in it, made in the usual way, and placed it in a frame with strong bottom heat; and to my surprise and pleasure, in three days, it emitted roots not only at the joint, but also up the stem. Having thus far succeeded, I procured a tin box, with a quantity of holes in the lid, and out of eighteen cuttings, I had seventeen good plants struck root, and potted in a week; and they flowered as well and better than others struck in the usual way. I think this a decided advantage over the old way of propagating, the cuttings not being so likely to damp off, as is frequently the case in sand.—*Weekly Paper*.

[There is do doubt of the Dahlia striking in water, but it must be potted as soon as it does strike, and be well watered with water, the same temperature as the frame the plant is going into.]

**GRUB ON GOOSEBERRIES.**—On a windy day, I placed a small chafing-dish, with a charcoal fire, to windward of each bush so affected, in succession. On the fire I put some few sticks, and a little damp grass to create a smoke, and sprinkled on it a small quantity of powdered brimstone, and then gave each bush a smart sudden shake, when the grubs fell to the ground. I watered them with strong lime-water from a large watering-pot. This operation I repeated two or three days after, when more grubs might be supposed to be hatched; and for the last five years have not seen one on my bushes. Care must be taken not to place the fire too near the bushes to scorch them.

[This remedy is good only in windy weather, for the smoke must be blown along the ground; all that rises is useless.]

**PURPLE LABURNUM AND CYTISUS PURPUREUS.**—An extraordinary freak of nature has occurred this season. Some large Laburnums which had been grafted with scions of the purple variety, grew vigorously, and, to supply scions and form heads, the shoots

were shortened in March; and on *two* trees so grafted, appears the *Cytissus purpureus*, the shoots of which have started in partnership with the Purple Laburnum from the same bud, both flowering luxuriantly and growing rapidly. The sportive shoots are decidedly *Cytissus purpureus*, with an upright tendency of growth, and a more luxuriant and abundant bloom than usually observable on that plant. That varieties should hybridize is an axiom all horticulturists are practically aware of; but I never before observed or heard of plants of different species becoming so intimately and curiously acquainted.

[We have no doubt several of these distinctions are but sports. We have had the Purple Laburnum with half the flowers in a bunch a bright yellow, and the other half its proper colour, while the habits were also apparently different.]

**OPENING PUBLIC GARDENS AND MUSEUMS TO ALL THE PUBLIC.**—The Town Council of Liverpool purchased the right from the proprietors of the Botanic Garden, of throwing it open on Sundays, and one other day in every week, to all the population. We sincerely hope this example will soon be followed in all other places where there are Botanic or Zoological Gardens. We should wish to see this done without delay in the case of the Zoological Gardens in the Regent's Park and Surrey, and also in the case of the Chelsea Botanic Garden and the Horticultural Garden at Chiswick.—*Weekly Paper.*

[Many efforts have been made to throw open public places of a Sunday, but if any establishments can be opened on Sundays with less harm in any point of view than others, it is public gardens. Hampton Court, St. James' Park, Kew Gardens, &c., prove that decorum is a leading characteristic among those who attend such places.]

**RAISING DOUBLE STOCKS.**—Sow the seed in flat pans or boxes about four inches deep; then place them in a hotbed of moderate heat, and there remain until the young plants are about two inches high; afterwards remove them to a south sheltered situation, where they must remain, without being watered, until they begin to flag, and even then must only be given so as merely to keep them alive, and must remain so till they are thought to have received a sufficient check. The above method I have now practised for a considerable time, and have never known it to fail.—*Gardener's Gaz.*

[This would make it appear that the check which the resting and starvation the plant undergoes is the cause of throwing the flowers double; one thing is quite certain, some people raise double, and some single, from the same packets of seed.]

**PREVENTION TO THE TURNIP FLY.**—A gallon of unrefined hartshorn mixed with two bushels of mould or ashes, and sown broadcast over one acre of turnip land after the seed is sown, will protect the plant from fly, as well as the insect which occasionally attacks the bulb.—*Agricultural Paper.*

["It is well worth trying; but were it in all cases efficacious it would be more generally known."]

**THE LOUDON MEMORIAL.**—As I think every lover of horticulture and floriculture must be willing and anxious to contribute something for the benefit of the relief of a person who devoted his whole life and means (both mental and pecuniary) to the advancement of that science, I would therefore suggest that the secretary of each horticultural society be requested to collect subscriptions, and forward them to a general committee, or to some one appointed to receive them, to be disposed of for the benefit of Mrs. Loudon, as shall be deemed expedient; and if each collect only a pound or two, it certainly would amount to somewhat worth notice. If you deem these suggestions worthy of notice, I shall feel most happy to do what lies in my power, and at having in the least degree been the means of assisting the widow of a person whose value the world never fully discovered until they had lost him.—C.

[We regret as much as any one the apathy that has seemed to reign over all the actors in this matter, but our last appeal roused a few friends, and we hope this notice will rouse a few more.]

**AURICULA SEED.**—I beg to mention a method of procuring seed without the least injury to the most valuable plants. While the flowers are in high bloom, remove and exchange the pollen through all the trusses of blossom on the stage, with the point of a pen-knife. Leave them until they begin to decline, then cut off the stalks. Have ready some fine sea-sand, in a vessel that will not admit of leakage, and stick the stalks in rather low, and keep the sand always moist. Leave the vessel of stalks on the stage until the seed is ripe, cutting off the trusses before they are decayed benefits the plants, and does not in the least injure the seed, which ripens quite as well in the moist sea-sand as on the plant.

[This probably will cause a smile among the good growers of Auriculas. It is one of the contributions to the *Gardener's Chronicle*, and signed *Elizabeth*. We may be asked why we quote subjects of this kind when we condemn them as absurdities?—as indeed any moderately informed reader will. Our answer is simple. Were such things to go unexposed in this age of weakness and folly, they might mis-

lead young florists, who would be too apt to conclude when they had followed such directions in vain, that there were no dependence to be placed in what they read in gardening works. When the seed has fully grown they will ripen better on the stems cut off and allowed to dry on paper in the full light than they will in wet sand, but no good cultivator of Auriculas would cut the stem while in full health from choice. The only safe way is to let them ripen on the plant, and pick off each separate seed vessel as it ripens, without cutting the main stem at all.]

**GUANO A PRESERVATIVE OF FLOWERS.**—Those who love flowers, and delight in having them constantly in their rooms, may continue to keep them fresh for a very considerable time, by putting into the water a pinch of Peruvian guano, which is rendered immediately soluble and taken up by the cuttings. Guano is essentially different from all other manures: it possesses most of the constituents of plants, and contains a great portion of salt and other antiseptic, and yet the most fertilising ingredients.—*J. R. Woolwich. — In Chronicle.*

[And those who have curiosity enough to try plain soft water, and change it frequently will find the nosegay in plain water will last as long as the flowers would on their own plants, and if they will turn back to our articles on the Elizabethan Vase for cut flowers, and adopt that principle they will find the blooms in perfection long after the period at which they would have faded had they never been gathered.]

**ROSA SULPHUREA.**—I beg to enclose a bloom of the old double yellow Rose (*Rosa sulphurea*), which is rarely seen to flower well in English Gardens. I imagine that my success in this case is mainly owing to judicious finger-pruning and the use of Humphrey's Inodorous Soluble Compound, dissolved in soft water, and applied to the roots as occasion required. This tree has not flowered before, although Bus-bridge used to be famous for yellow Roses. I have flowered *Rosa sulphurea* some years back in Northamptonshire, in a different soil and aspect from this; therefore my experience leads me to infer that much depends on finger-pruning and the free application of stimulants during the growing season, particularly from the time the flower-buds appear until they burst into beauty. The plant here is in a south-west aspect; the soil is a sandy loam; the gardens are in a sheltered valley, contiguous to large sheets of water. The Rose sent is an average-sized specimen from among many flowers that are now open on the same plant.—*Henry Bowers.*

[Henry Bowers might have mentioned how

he got Mr. Humphrey's Inodorous Soluble Compound in Northamptonshire, seeing that at that period the compound was not in existence. There happens to be good proof on record that the yellow Rose succeeds on the most impoverished soil, among brick rubbish, and in the most contrary soils and aspects, and we look at its success in peculiar localities and different soils, as one of the many proofs that the atmosphere has quite as much to do with plants as the soil, we are nevertheless always glad to hear of the yellow Rose, only, we should be quite as well pleased if people who seem to know little about it, would give us the facts only, and let others draw inferences.]

**THE UPAS TREE.**—A living plant of this celebrated tree has been lately presented to the Horticultural Society by the East India Company, and is now growing in the Chiswick Gardens. It is in perfect health, and notwithstanding the fables of Dutch travellers, perpetuated by Darwin, may be approached with safety. It is, however, so virulent a poison that no prudent person would handle it without proper precaution.

[There was a time when it was believed that this tree was an inhabitant of the island of Java, that within a given distance of it nothing in the way of animal life would exist; that a circle round it was strewed with skeletons of victims who had fallen sacrifices as soon as they reach within its influence, and that criminals were always doomed to fetch poison from the tree as a punishment. We forget whether it is recorded that any one ever escaped, but it was mentioned that the criminals selected boisterous weather, and approach on the windward side, that the effluvia of the poison might blow from them, this has all been proved long since to be fabulous. Poison which is used for arrows and other virulent purposes is prepared from the tree, hence the remark about approaching the specimen in Chiswick Gardens.

**SINGULAR TREE IN NEW ZEALAND.**—One of the most extraordinary trees of the forest is the Rata, which, originating in a parasite, grows to such a size as to rank amongst the giants of the forest. It first makes its appearance in the form of a tender Vine, clasping the trunk of some huge tree with its long tendrils, and growing both upwards and downwards, and increasing in bulk at the same time. After a while the parasite, having killed the parent trunk, establishes itself upon its roots, sends forth numerous branches aloft, which again send forth aerial roots clasping the neighbouring trees—and ultimately, the Rata occupies a larger space than any tree of the forest. It is under this tree that the curiosity

so well known as the vegetating caterpillar is found; and instances have occurred of natives lying down to sleep under the Rata having been found dead. The tree is now always carefully avoided by them.—*Simmonds' Colonial Magazine*.

[This plant is said by Doctor Lindley to be the *Metrosiderus robusta*, some account of the vegetable insects was given in *The Gardener's Gazette* by Doctor Murray a few weeks since.]

MANURES.—J. Mc. J.—It is an incontrovertible principle that the best manure which can be given to a plant is the same species in a decayed state, with the addition of such matters as are lost in the process of decay. Therefore Peach-cuttings are the best manure for Peach-trees, as far as they go. But, since a good deal of matter in the form of fruit and flowers is carried off and cannot be restored, other matters in aid of the Peach-cuttings would be necessary where the soil is exhausted.—*Gardener's Chronicle*.

[It is the custom in many foreign vineyards to keep all the cuttings of the vines near each plant, and at the proper time to bury them as dressing for the roots. But, we are not prepared to go the length of some theories. As a self-evident proposition we admit that if ground be rich and good, the return to it of whatever a plant takes away would be proper, but nobody knows what a plant does take away, they analyze a plant and find it contains so much of A, so much B, and so much C, but they know as yet no more than the man in the moon how much of A, B, C were taken from the land, and how much from the atmosphere.]

CALCEOLARIAS.—A successful cultivator of the Calceolarias has this season produced them one inch and a half (and rather more) in diameter, and very globular. His compost nothing more than soft bricks powdered, watering with guano, four ounces to two gallons of water.—I. L. E.—*Gardener's Gazette*.

[Few people are aware of the efficacy of burned soil, particularly burned clay. It is beginning to be understood better, though known many years by few. Powdered or rather broken flower-pots have been long used for drainage; and the great affection which the roots of plants seemed to have for them, led persons to mix them with the soil. Now really good cultivators of plants keep half a dozen sieves to prepare these broken pots, of various sizes, from the size of marbles, downwards to the dust itself, for the express purpose of mixing with the soil a compost which they are preparing; of course bricks are very similar in character, and so also is burned clay, which farmers are using in such quantities.]

WHITNEY'S COMPOSITION.—Parties using

this preparation are recommended to use strong glazed Calico or Irish linen, as it is quite as transparent as Muslin, and much stronger.

[The composition is working a complete revolution in some branches of culture, and is worth every body's attention. The only objection to the very thinnest textures is their greater liability to damage, but in the thicker fabrics this is got over, and by keeping the texture more open it admits more of the composition to fill it, and the composition itself is as transparent as glass; but if it be found tolerable in winter, spring, and fall, it must be everything in the bright scorching heat of summer.]

Mr. Hepworth's Byblomen is a great acquisition to our good flowers, and will take its stand among the best half-dozen. It is better in form, texture, and marking, than we ever saw violet quarto; petals broad, and lay well together; bottom clean; white pure. We accept the honour of naming it "QUEEN OF THE NORTH," and we can answer for the southern growers paying due honour to her Majesty.—*Glenny in Gardener's Gazette*.

[We should like to live long enough to raise some flower which this most severe of all critics will allow to be "a great acquisition to our good flowers." We presume few Tulip growers will like to be long without a little "Queen of the North," if her Majesty will but deign to be prolific.]

#### ON PREVENTING THE DEGENERACY OF APPLES.

ALTHOUGH we have many most excellent apples and pears now in cultivation to furnish our tables with a delicious collection for a desert, yet I should be exceedingly sorry to hear many of the old sorts are fallen into utter neglect. Where are all those fine sorts cultivated in Farber and Langley's time? I fear a great part of them are irrecoverably lost. I am doubtful the impression made on the minds of many of our modern cultivators by so high authority as T. P. Knight, Esq., has had a great tendency to produce this effect; and although I am willing to admit, that in the mode generally practised of taking the graft indiscriminately from old trees, it seldom succeeds; yet, if it now and then meet with success, it is worth the trial; for many of the old fruits now lost to the catalogues, if my taste as well as memory don't fail me, when a boy at school (now upwards of sixty years ago) were excellent. I should not presume to offer an opinion which appears in opposition to that of the late President of the Horticultural Society, was I not countenanced by so old and experienced a gardener as Mr. Rogers; but having experienced it once under my own direction, and

observed it in some others, I am clearly of Mr. Rogers's opinion, that if particular care and attention was paid to the selection of a healthy and vigorous scion from a healthy branch of an old sort of fruit tree for grafting, the produce would be healthy and productive. A gentleman at Monmouth (Mr. Probyn) had at his country seat, a small distance from that town, some years ago, a young Orange Pippin rose from seed, as much like its parent as possible, only something larger. There is also Mr. Knight's admirable method of impregnation, so honourable and monumental to his immortal fame, from which to obtain many valuable new sorts. The little St. Germain I don't now see in modern catalogues, so that I suppose it is nearly lost, is an excellent middle-sized winter brown pear, grafts of which, I have no doubt, might be had on proper application to Mr. Healing, of Apperley, near Tewkesbury, Gloucestershire. There is also a most excellent small table apple little known, called the

Chaceley Harvey, rose from seed, as I have understood, in the garden of the late — Dowdeswell, Esq., of Chaceley, near Tewkesbury, where the original tree now is, and where, I have no doubt, grafts might be had, if required, on proper application to Mr. Higgins, the present occupier of the premises. But it is vain and useless for an obscure inexperienced person like myself to point out where the old fruits in highest estimation are to be obtained. It is with the view of exciting, stimulating, or calling into action the attention of your numerous friends and correspondents, the nurserymen and modern amateur cultivators, so much better able to accomplish it, that these observations are made. If you think them worth your attention, your giving them a place in your valuable and widely-circulated work, may if met by a corresponding mind, be highly gratifying to that of an admirer of all the olden things that are good.—RUSTICUS.

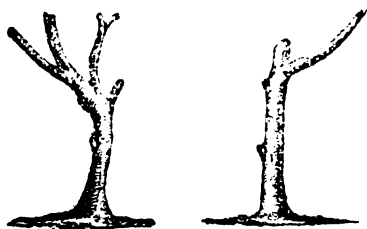


#### RUSTIC WORK.

**THERE** is no limit to the form or fashion of rustic work. There is not an erection from the pigstye to the mansion which may not be formed with it, and although some are much more appropriate than others, it is peculiarly adopted for arbours, seats, alcoves, and other attributes of a garden. There is hardly any thing which gives so much room for the display of ingenuity and taste. The great principle upon which all the refinement of rustic work turns, is that of making all things uniform, and however oddly a fancy branch of part of a tree may be formed, the merely cutting it t'rough with a saw forms a duplicate

which preserves uniformity in any construction to which it is to be applied. We have before given some examples of this, and here we have others, the two side portions of any thing may be formed of a branch that would do for one side, and thus whatever may be the design, this feature may be preserved even to slight details. A summer-house may be constructed as roughly as possible, and if there be any thing to which we can nail a rustic front, there is no difficulty in getting it. The examples here are merely those of branches which look nothing of themselves, but which by splitting in half, and using one for each side, may be

converted into a fair rustic entrance, and these branches abound in any wood, no matter what,



that can be found large enough upon the premises, make your arbour or summer-house or any other building, and there is no difficulty in procuring wood to complete it. In like manner may rustic garden seats be formed, whenever and wherever they are wanted; not a limb of any tree, large enough, could be, found that might not be used for some part of the construction; but seats need not be made uniformly, because they may be made like a couch, or after any other fashion.

#### NOTES ON TREES.

MORE than one half the battle is won by making each portion of the forces do the part they are best calculated for, and on planting an estate it is of the first importance to consider well what wood will be likely to flourish in the soil you possess. Main has done some service in his *Planters and Pruners Assistant*; and if we do not agree with all he says about pruning, there is something to be learned from every page. The following notes are chiefly abridged from his work, and are worth attention:—

The genus Willow is very extensive, there being no less than one hundred and sixty-six species already described. Many of them are highly useful plants, and a few are even worth cultivation for their timber. A Lincolnshire proverb declares that “a willow will be worth a horse, before an oak will be worth a saddle.” This is an allusion to their rapid growth; for though their timber is light and by no means durable, the quantity produced for shoe-last, cutting-boards, a few domestic articles, and even for firewood, compensates the planter. Though the Willows are chiefly shrubs, several of them rank as timber trees, particularly the white or Huntingdon species, when planted on rich moist ground, where it becomes a large tree in a very few years. It is not so soon liable to rot at the centre as some of the others, and therefore affords boards of good width for many useful purposes. The yellow-branched, the brittle-twigg, and the great-round leaved, rank next to the Huntingdon as trees, and also

for coppice. The common osier and several others are cultivated for the basket-makers.

Of the poplar genus we have now a good many very stately trees, both native and foreign. Of the former we have the abele or white, the snow-white, hoary, aspen, and black; and of the former we have the Athenian and black Italian, both valuable kinds, and well worth the attention of planters. The Lombardy, for its tall conical shape, quick growth, and unrenderable quality of its wood, is a universal favourite for planting on land naturally moist. Several of the American species attain to a very large size in this country; as the Carolina, the neck-lace-bearing, the large-toothed, the sweet-scented, &c.

The Lime, if not a native, has been naturalised for ages. Four species are said to be found in our woods; namely, the small-leaved, intermediate, common red, and broad-leaved. They are more ornamental than useful timber trees; though their mild, close-grained, light wood is chosen for many purposes—as carving and the like. The flowers are sweet-scented, and their outline being regularly formal, are particularly well adapted for beautiful scenery. There are six exotic species in our collections, all of which are hardy.

The Horse-chesnut, in its general character as a tree, ranks with the Lime. Its timber is inferior; and its value consists in its fine flowers, and majestic port when full grown. There are four species; namely, the smooth-leaved, the Ohio, the ruddy, and the pale-flowered; there are also varieties with party-coloured leaves and different flowers. There is a nearly allied genus called Pavia, which has been separated from the Horse-chesnuts, on account of their fruit being smooth, instead of prickly like the chesnut. The pavias are smaller trees, but the flowers of some of them are remarkably showy; as red, flesh-coloured, and yellow. They, like the Chesnuts, are only considered ornamental.

The Spanish, or Sweet Chesnut, is a valuable timber tree, and one of the best for underwood: it thrives in any gravelly loam. There are five species of this tree: namely, the common, the black, grey, ash-leaved, and wing-fruited, all trees of considerable stature.

Nearly related to the Sweet Chesnut is the genus *Carya*, or hiccory-nut, of which there are ten species, natives of North America. In this country they form elegant trees of middling size, and very suitable for garden scenery.

In the same natural order with the foregoing nuts, we find the common walnut a valuable timber, as well as a fruit tree. The walnut has naturally a large-spreading head, because it is allowed ample space when planted in orchards; but when placed thickly toge-

ther among other trees, it rises as quickly and attains as great a height as any other in the forest. Treated as a forest tree solely in consideration of the value of its excellent timber, we have no doubt that it would turn out as profitably as any other kind whatever.

Another fruit tree which furnishes durable timber is the wild cherry. It grows rapidly among others, and attains to a considerable bulk of bole as soon as most other forest trees. The wood is valuable to the cabinet-maker; and the heart, if sound, is as durable for gate-posts as the oak itself. It is a tree which should not be rejected by the general planter. Some of the cultivated varieties become immense trees before they fall to decay; the owners being obliged to have *fifty-round* ladders to gather the fruit.

The *platanus* of Asia, where it is much regarded for its shade and large size, and the other species from America, hence called the western *platanus*, are both noble trees, and particularly well adapted for park scenery; but they are not yet ranked as forest trees, their wood being light, and though pretty dense, not so durable as our other more common trees. As, however, they arrive at a large size in a much shorter period than some of our other foresters, they deserve notice, as their timber for minor purposes may be equally valuable with those of a more coarse and hardy nature.

One of the most interesting and useful order of trees is the *Coniferæ*, or cone-bearing. This title includes the pines, the firs, larches, cedars, cypresses, arborvitæ, yews, &c. Of the pines there are above forty described, only one of which is indigenous to Britain, namely, the wood or Scotch pine, found in the original forests in the North of Scotland. Of this tree we have two sorts: one having a rough, longitudinally cracked, persisting bark, with branches rising obliquely upward and aggregately forming a pyramidal head when young; the other having a thinner, smoother bark, successively thrown off in irregular-shaped pieces, with branches less numerous, and stretching out in a nearly horizontal direction, and at last nearly drooping. From this position of the branches they are liable to be split from the bole when loaded with snow or ice in certain states of the weather.

The other species of pine which have been found to answer best in our plantations, are the pinaster or cluster pine, the stone, the Weymouth, the *Cimbra*, New Jersey, and the Corsican pine or larch. There are above thirty others described, chiefly considered as objects of curiosity rather than useful trees, and therefore only met with in botanical collections.

Of the firs none are natives of Britain, all being found in North America, or on the continent of Europe. Those mostly preferred by the British planter are the silver, the Balm of Gilead, and the different species of spruce fir. Of these last there are four species; namely, the Norway, the white, the red, and the black. The Norway and the white are most prized, because of their rapid and lofty growth. The hemlock spruce arrives at a middling-sized tree in this country, but is a slow grower and only suitable for dressed grounds. There are twelve other sorts of firs introduced, but too lately to show what they may ultimately become in the climate of Britain.

Of the larch there are four species; namely, the common white, the Daurian, the black pendulous, and the small coned red. The first is most generally planted, and proves to be one of our most valuable timber trees.

The cedars are mostly ornamental trees; for though that of Lebanon attains to a full size in this country, its timber is of little value to the builder. Several trees of this species were felled off the estate of Moor Park, in Hertfordshire, about forty years ago, containing five loads of timber each, and which were purchased by London builders for quartering, at no higher price than they gave for the youngest Scotch pines felled in the same park. Another species of this tree has been introduced into this country from Nepal, called *Deodora*; and hopes are entertained that it may be naturalised. That beautiful tree, vulgarly called the deciduous cypress, is now a new genus, of which there are two species known as *Taxodium disticha* and *T. capensis*. The latter is only a shrub; but the former attains to a very large tree.

Of the cypress we have only the common evergreen species, and two varieties; but they do not rank as forest trees, though yielding extremely durable timber.

There are a few inferior foresters, which, though they do not rank as timber trees, deserve to be noticed: one is the hornbeam, a middling-sized slow-growing tree, found wild in many places. The trunk, though never large, yields timber of a remarkably tough character, on which account it is useful for many rural purposes, farm implements, &c.

Of the maple, besides the sycamore, there are two other wild sorts common in this country. The wood, both of the roots and stems, is much valued by cabinet-makers. There are numerous species of maple introduced from the South of Europe and North America; but they are only employed as ornamental plants.

The tulip-tree and yellow-flowering *Virgilia*, are two North American ornamental trees; but as they grow freely in our woods, and at-



tain to a timber-like bulk, their wood may be found to be useful for some purposes in this country at present unknown.

These slight notes are introductory to a series of papers by a very popular author, illustrating the principal timber trees of great Britain, which may be commenced, probably, in the present volume, with correct embellishments, explanatory of the general figure and style of growth which characterises the leading kinds.

#### THE USE OF A FREE ACCESS OF AIR TO ROOTS.

By C. W. JOHNSON, Esq.

THIS subject has already been treated variously by different authors, but the practice of florists has always been consistent with the importance of air to the roots. Choice things, such as Tulips and Ranunculuses, are no sooner above ground than the earth has to be stirred all over the surface. In the necessity of this, the practice of the last fifty years or more universally agrees. Mr. Johnson applies his remarks more to trees; but the explanation is worth attention. He says—

“The quantity of water consumed by plants, when in a state of healthy vegetation, is so great, that, if it was not for the gentle steady supply, thus imperceptibly furnished to the soil by the atmosphere, vegetation would speedily cease, or only be supported by incessant rains. Thus, Dr. Hailes ascertained, that a cabbage transmits into the atmosphere, by insensible vapour, about half its weight of water daily; and that a sunflower, three feet in height, transpired in the same period, nearly two pounds weight. Dr. Woodward found that a sprig of mint, weighing 27 grains, in seventy-seven days emitted 2543 grains of water. A sprig of spearment, weighing 27 grains, emitted in the same time 2558 grains; a sprig of common nightshade, weighing 49 grains, evolved 3708 grains; and a lathyrus of 98 grains, emitted 2501.

“It has been shewn by the experiments of M. Saussure with some sprigs of peppermint, that, when supplied with pure water only, and allowed to vegetate for some time in the light, that they nearly doubled the portion of carbon they originally contained. This they could have procured only from the atmosphere; and, under these circumstances, there is now little doubt of the correctness of the conclusion of M. Berthollet, that plants, by means of their leaves, have the power of decomposing the water, as well as the carbonic acid of the atmosphere, and furnishing with these elements, new combinations. How essential a free access of the atmosphere is to the roots of plants

was long since shewn by M. Saussure, who found that oxygen gas is absorbed by the roots of plants, as well as by their leaves; and that it is at the roots united with carbon, and transmitted to the leaves to be decomposed. Even the branches absorb oxygen: in its absence, flowers will not even expand. The advantages of a free access of oxygen to the roots of plants, has been still further shown experimentally: it has been proved, that their vegetation is greatly increased by nourishing them with water impregnated with oxygen gas; hence, too, the superiority of rain-water. Some remarkable experiments were made by Mr. Hill, demonstrative of the great benefit plants derive from oxygen gas being applied to their roots. Hyacinths, melons, Indian corn, &c., were the subject of the experiments. The first were greatly improved in beauty, the second in flavour, and the last in size, and all in vigour. This is another use of a free access of atmospheric moisture; for M. Humboldt has clearly shewn, that a dry soil is quite incapable of absorbing oxygen gas. Now, it must be evident, even to the most listless observer, that the more deeply and finely a soil is pulverized, and rendered permeable, the greater will be the absorption of both oxygen and watery vapour from the surrounding atmosphere.

It is, perhaps, needless to prove, that the roots of commonly cultivated plants will penetrate, under favourable circumstances, much greater depths into the soil, in search of moisture, than they can from the resistance of the case-hardened subsoil, commonly attain. Thus the roots of the wheat-plant in loose deep soils, have been found to descend to a depth of two or three feet, or even more; and it is evident, that if plants are principally sustained in dry weather by the atmospheric aqueous vapour absorbed by the soil, that then that supply of vapour must be necessarily increased, by enabling the atmospheric vapour and gases, as well as the roots of plants, to attain to a greater depth; for the interior of a well pulverised soil, be it remembered, continues steadily to absorb this essential food of vegetables, even when the surface of the earth is drying in the sun.

“And by facilitating the admission of air to the soil, another advantage is obtained,—that of increasing its temperature. The earths are naturally bad conductors of heat, especially downwards; thus it is well known, that, at the siege of Gibraltar, the red-hot balls employed by the garrison were readily carried from the furnaces to the batteries in wooden barrows, whose bottoms were merely covered with earth. Davy proved the superior rapidity with which a loose black soil was heated compared with a chalky soil, by placing equal portions of each

in the sunshine;—the first was heated in an hour from sixty-five degs. to eighty-eight degs., while the chalk was only heated to sixty-nine degs. This trial, however, must not be regarded as absolutely conclusive, since the surface of the black soils naturally increases more rapidly in temperature when exposed to the direct rays of the sun, than those of a lighter colour. A free access of air to all soils also adds to their fertility, by promoting the decomposition of the excretory matters of plants, which otherwise would remain for a longer period, to the annoyance of the plants of the same species."

How well do those orchards which are cultivated for under crops, answer, when compared with others whose surface was never disturbed? Witness the fruitmarket-gardens round London.

#### THE GREENHOUSE RHODODENDRON.

THIS distinction is applied to all those species which will rest secured well in the open air, and comprises many very interesting and showy kinds. The treatment they require to induce bloom is too often neglected, and this has induced the Editor of the *Florist's Journal* to devote a short paper to the subject in the present number of this work; there is nothing very remarkable in the paper, either for novelty or utility to the novice, but as it contains a hint or two that may be useful to people who wonder their Arboreums and some Hybrids do not bloom every year alike, we give such parts as will apply to these cases.

**THE MANAGEMENT OF GREENHOUSE RHODODENDRONS.**—The management of Rhododendrons is in itself extremely simple when understood; yet to explain it, I must be allowed to go through it in a concise manner. These, like most other American shrubs, delight in light fibrous heath-mould, and should be allowed plenty of it; for they are not fond of frequent shifting: repotting should be performed immediately after blooming, that is to say, as soon as the flowers begin to fade, all the additional stimuli are then thrown into the production of a rich luxuriant growth, on which are based all future expectations; while growing, the plants should be kept in a temperature of about 55 or 60° and receive a very liberal supply of water: this usually occurs about the latter end of April and beginning of May, sometimes a week or two later, according to the period of flowering, and the formation of the new wood generally occupies from three to four weeks. After which follows the most particular point of their management: if the watering and warm temperature is continued beyond the period necessary

for the due completion of this first growth, another production of new wood immediately follows, which is the sole cause of the non-production of flowers: the prevention of this second growth is what consequently requires the cultivator's most particular attention, and is almost the only important point in their culture. It must, however, be observed, that it is necessary to get the first formed wood as large and strong as possible, or puny and few will be the flowers; but it is also equally necessary to discontinue the watering, and to place the plants in a cool situation out of doors immediately it is completed: to do this exactly at the right time requires some considerable amount of practical skill; but when once ascertained correctly, every thing is perfectly easy; the plants then only require just enough water to preserve them from flagging. During the heat of summer, and at the usual time of housing plants, a warm situation in the greenhouse should be secured them. If an early bloom is required, they may be placed in a gentle heat directly after Christmas, though this is better avoided, from the trouble it causes to properly check and ripen the first growth; because at that early period of the season in which forced wood will be produced, it is not safe to place them out of doors, and a greenhouse is seldom cool enough to prevent the second growth.

It will be seen that the principle of blooming is the same as with the Camellia and fifty other subjects, let the growth be completed and then let the plant rest.

#### ON THE CHRYSANTHEMUM.

ON looking an early paper in *The Gardener*, find an excellent paper on the properties and cultivation of this valuable flower; I say valuable, because, with a little care and attention, the greenhouse, and even dwelling-house may present a beautiful and cheering appearance, when very few other plants are in a flowering condition.

I am induced to send this article first, that it may have the effect of causing amateurs (of whom I am one) to set about the work essentially requisite for securing a good flower on a neat, tidy bushy plant, which is a *sine qua non* in my opinion.

I think nothing is a greater eye-sore to a lover of neatness, than a parcel of tall, straggling, half-naked, ill-conditioned, helpless Chrysanthemums, supported by crutches, and utterly unable to stand alone!—Now this may be utterly prevented by timely care—and instead thereof, it is quite within the range of possibility to grow a compact, bushy, well shaped plant, not at all rickety in any of its

limbs; and adorned with a profusion of splendid heads of flowers.

Let cuttings be taken from the thickest and strongest tops of branches during the latter end of June, strike them in a slight hotbed, and remove them into the greenhouse as soon as rooted: the cuttings must not be longer than three or four inches, (the two or three lower leaves of course being removed, and the under part of the cutting being close under an eye or bud) and the plant must be removed from the hotbed as early as possible into the house, to secure a dwarf plant. Afterwards give them a moderate supply of water and plenty of light and air.

2ndly. In the paper mentioned before, it is stated "There is a strange obstinacy in this plant, for it can hardly be forced into bloom before its ordinary time." This is well known to be during the latter part of autumn and earlier weeks of winter. Now I have for some time past been using my best endeavours to throw this plant into unseasonable growth, that is, I have tried with some, for I should be sorry to be without any of those beautiful flowers in their own season. I have for once succeeded, and have had two or three plants blooming well this month, and one I have at this moment flourishing luxuriantly as if in the depth of winter, and seemingly unconscious of its being a solitary intruder; it is a fine dark broad petalled flower, by name "Sultan."

I took off the cuttings late in July, after striking them I let them remain in the small pot they were transplanted into until they shewed their flower buds. I then cut down the plants, leaving only three eyes,—supplied them liberally with liquid manure,—stunted their growth by keeping them in the confined pots; when winter came on protected them from the frost as much as possible, without fire-heat—in January removed them into large pots, in March into still larger ones; and the result is what I have long been aiming at—*Chrysanthemum* flowers in April, May, and June. The only one I have now left is open for the inspection of any who are curious in such matters. HENRY BOOTHBY, Jun., *Louth*, May 31, 1844.

#### GUANO.

A LIVELY interest has been excited in the Colonial market, owing to a sale by auction of the first cargo of Guano imported into London from the recently discovered island of Ichaboe, on the western coast of Africa. This interest was increased by a similar sale in Liverpool, a few days before, of the largest quantity that has hitherto come from the

same place, in one bottom, namely, the ship Blake, of one thousand tons. The competition at both sales was very spirited, and each cargo was sold in about twenty minutes. The desire for Ichaboe Guano, has arisen from the fact that all the eminent chemists who have analyzed it have found it to possess the fertilizing properties in the highest degree; and the results of its application by practical agriculturalists have proved the correctness of their analyses. This island (Ichaboe), which three years since was unknown, is about a mile and a half in circumference, and is deeply covered with Guano, the deposit of sea-birds that have for ages remained undisturbed in their possession. Information of this discovery was at first confined to a few houses in Liverpool and Glasgow; these having already succeeded beyond their most sanguine expectations, in having at once disposed of all their arrivals, and chiefly for the northern ports. The farmers in the northern and some of the western districts in England and in Scotland, were among the first to try Guano, when introduced from South America, four years ago, and have had the best means of ascertaining its qualities. The consequence is that the consumption in these parts of the kingdom is this year increased at least twenty times above that of last year; being no small evidence of the superior merits of this invaluable manure. Besides the demand for home consumption, several ships have discharged in the West Indies, and there are large orders for various ports on the continent.

The immense benefit to the shipping interest, from this new branch of commerce, may be conceived, when it is known that about four hundred ships are on their way to Ichaboe and the adjoining islands for the next year's supply, and that from this cause the value of shipping has advanced 15 to 20 per cent.

It is to be hoped another harvest will realize the assertion of Professor Liebig that "with the general application of the *Native* Guano in England, *there can be no question* that the importation of foreign corn might be altogether dispensed with.

#### PLANTING A PARK WITH FRUIT TREES.

By the late George Cumberland, Esq.

THE late George Cumberland was the author of several works connected with the fine arts, and also of an "Attempt to describe Haford," in Cardiganshire, and of a "Sketch of Bromley Hill," in Kent. The following is extracted from a postscript to the last mentioned volume:—

"The author informs us that the idea of surrounding a residence, particularly in the vici-

nity of London, entirely with fruit trees, had long been one of his favourite ideas; and that he conceived that an estate so laid out and planted, would form 'a union of beauty, with public as well as private utility, suitable to a rational economy.' The idea occurred to him from seeing the fruit plantations in Spain, with which that country, in some places, is embellished for many miles together.

"To give a general idea, which is all I have room for at present, I would premise that the extent of the territory be secured from depredations by a sunken fence of sufficient depth, guarded at the top by hanging rails, that are moderately strong, and lean inwards to the grounds; indeed, long experience has taught me the use of this unexpensive method, for, of all others, it is that which even the poacher fears most, as being, whilst too weak to bear him going in, the most difficult to escape over getting out, when they are also generally hurried; and always betraying, by its condition, where the attack has been made, often by its giving way, the point of assault.

"There is another reason for this open fence; it gives air to our plantations, which perish under the old fashioned belts, whether enclosed with wood or wall; and, above all, it rewards us with views of the neighbourhood, and displays our own taste and liberal notions to our neighbours, affording no shelter to the prowling thief, no concealment to the idle domestic.

"This completed, I next purpose to make all the plantations of fruit-bearing trees, of every species, suitable to the soil and situation, to give rules for which would fill many pages; for, like Michael Angelo's famous group of cypresses and pines, at Rome, he who plants must well consider what will be their appearance when arrived at maturity, and what their general product in order to prepare buildings for storing and preserving it; all of which buildings may be as well made to contribute to the ornament of the place as not.

"Nor let it be supposed that this scheme would ultimately be unprofitable as to timber, for it is well known that walnut, plum, pear, and chestnut trees, are esteemed good wood; and even the cherry yields no contemptible price at a certain age, when it is no longer valuable for its fruit crop.

"This plan would insure the owner his cyder, perry, and made wines, and afford his table a profuse dessert; enable him, at a cheap expense, to gratify his visitors and neighbours; and whatever was in superabundance would readily find a market; while its beauty, at most seasons, would be unparalleled, particularly in spring and autumn: and its attraction for birds would, on account of its extent, be a delight, rather than an inconvenience, giving

life and song, where otherwise would reign solitude and silence.

"I have heard all the objections which can be made to this scheme, but none appear to me to be of a nature not to admit of a remedy; and some (such as that part would be pilfered or destroyed by school-boys) of too miserly a complexion to demand one. The greatest would be, what is called, the loss of the soil for grass, as in the commencement no animals could be admitted; but this, I apprehend, ought to be the case in all plantations, for when trees of any sort are not suffered to grow down to the ground, more than half of their beauty is gone for ever, and with fruit trees more than half their profit. For trees that are suffered to fan naturally downwards are not only more beautiful, in an infinite degree, but less liable to blight, less subject to injury in being divested of their fruit, easier of access to remedy any disorder, and greatly benefited by the effluvium of the soil, which they preserve moist during summer by their shade, and nourish in winter as well as shield by their fallen leaves.

"Above all, we ought, in the commencement, to be active with the spade—a profitable labour; and nothing hinders us from making the most agreeable walks among fruit trees, any more than shrubs, which, however, may, in part, be mixed with them, especially near the house, where winter shelter is wanting. But, as I have no further space to enlarge, I must leave this as a hint for better judgments to improve upon, convinced as I am, at any rate, that such plans, if put in practice on a very large scale, would soon exhibit the image of an earthly paradise."

#### THEORY AND PRACTICE OF HYBRIDIZING.

THE operation of Hybridizing in plants is similar to that of cross-breeding in cattle, and the object is to improve a breed. By crossing two species of the same genus, a Hybrid plant partaking of the nature of both may be produced, but there is a difference between the produce of two seedling varieties and the produce of two separate species: yet in the present confused state of botanical science, when two or three professors will be haggling in public and private, about whether a plant be one genus or another, it is no easy thing to determine what is a species and what is a variety. We will write of hybridizing then in the most enlarged sense of the meaning and object of cross breeding, and so that flowers are very different in habit and appearance, we will consider them quite wide enough apart to be worth crossing, if any good object can be attained by it. We will not stop to enquire

if a thing be a distinct genus or not, though there are some distinctions sufficiently notorious to leave no room to doubt: for instance, where one is hardy and the other tender, there can be little difficulty in assuming them to be different species. However, on the more enlarged meaning of Hybridization we will take any two opposite qualities that it may be desirable to amalgamate in the production of a new race, and upon the management of this operation depends how far we succeed. Let us first then consider what are the objects to be attained by Hybridization, besides mere change? We think, first to obtain for some tender plant hardiness, or second, for some hardy plant beauty. Let us take then for these two divisions the *Rhododendron*. The *Rhododendron Ponticum*, *Maximum*, *Cataubiense* and some others are hardy, but their colours are white, and purple of various shades from dark to almost lilac, or even lighter than that. To Hybridize these one with another, then would hardly attain any thing but different shades of the purple, but these having been attained already we have to seek something more. We find then that there are very beautiful species grown in warmer climates, which prove not to be hardy. Now comes the principle of Hybridizing for a distinct purpose. The first object that struck the successful growers was the desirableness of obtaining the magnificent colours of the tender sorts on the hardy nature of the others. To do this, the hardy kinds were fertilized with the pollen or powder of the tender and highly coloured ones. This was done by several of the early growers, and they obtained upon the habit of nearly all the hardy ones the splendid scarlet crimson of the more tender kind. Hence we had *Russeliana*, *Cunninghamii*, *Smithii*, and a host of others. These in their turn seeded, and were crossed, and gave still more varieties, but the result was different upon different kinds. The *Ponticum* hybrids being the least handsome in the foliage, the *Cataubiense* the most handsome; the others affording, however, some diversity. Now it happens that those who seeded from the tender kinds obtained no one point, they were as tender as the parent, and made no change except being worse colour than themselves. Here then is a strong case, by Hybridizing one way we loose ground; by effecting the same thing the other way, the hardiness was retained, but the colours were improved; thus it is to go blindfold to work or go to work with a distinct object. By crossing the hardy sorts with the large blooming white greenhouse kinds; much larger white flowers were obtained, while the hardiness was preserved, and it is not quite clear that some of the

flowers on the hardy kinds do not fully equal the tender species by which they were fertilized. But there are still more grand effects produced in this tribe of plants. The *Azalia* is by some considered the same genus as the *Rhododendron*. Mr. Smith, of Norbiton, calculating upon this, fertilized the *Rhododendron* with the *Azalia sinensis* which is a bright yellow, and produced a variety which we have noticed in an earlier part of the work, and introduced an entirely new colour into the *Rhododendron*; whether Mr. Smith was fortunate enough to do this on a hardy variety or otherwise we have yet to learn, but as he was an early labourer in this delightful field, we have no doubt he has; if not, indeed it would show one of the instances of lost labour or rather of half success, because the great desideratum is to produce plants which the million, who have no glass, can grow, instead of the limited number who have; to give us in fact a plant to add to our shrubberies, instead of one merely to fill our greenhouses. But, we have various coloured azalias, the orange coloured hardy deciduous variety, which will live, though anything, might as easily be thrown into the noble evergreen as the *Azalia sinensis* has been, and thus another grand addition might be made to our hardy *Rhododendrons*. The other colours among *Azalias* could not serve us much. In short, by hybridization every thing, hardy with the tender exotic species of *Rhododendron*, and *Azalia* we might for all we know, or have reason to believe to the contrary, yet their bloom on the hardy evergreen. Now let the operation be reversed, which it has been by many thoughtless people, the seedlings actually raised from the tender ones will continue to perpetuate a race of tender ones, and not forward us at all in our shrubby plants.

It is obvious, therefore, that whatever flower we take in hand, our object should be some decided improvement, and that our work should be conducted with judgment and reason. In all shrubs we should hybridize on the most hardy with the most handsome. Take another flower in which we have no hardy varieties, but where the object is solely improvement of the form, size, and texture of the bloom. Our proceeding must be marked with judgment, or we may be working for nothing for years. Witness the world of weeds created among *Fuchsias*. Most people have progressed backwards instead of forwards. Many fancied they were doing wonders when they sowed seed from *Fuchsia Fulgens* without once troubling themselves to fertilize at all, but finding it a free seeder, they merely produced *Fuchsia Fulgens* again, or variations from it, for the most part worse than the original; it was a

variety coarse in itself. Others hybridized the Fulgens with the varieties or species we already possessed. These produced varieties infinitely worse than both originals; the great tendency of the progeny was to shorten the flowers, and thus take off the novelty which the long drops of Fulgens possessed, and darken the colour which was the best point about the Fulgens; so that we had multitudes of varieties without effecting the slightest improvement in one-tenth of them, nearly every thing being coarser, shorter, and darker than Fulgens, without bettering the habit of the plant, or accomplishing one single good point; and now let any one look through the hundreds of hybrid varieties and look in vain for half a dozen that are really better than the original species: if they find six decided improvements on the form and texture of the flower, we shall be surprised and pleased. But it has been complained of two years ago, that persons were doing wrong by saving seed from the coarse varieties instead of the fine ones, and that in all the crosses wherein there was a marked difference, that difference was for the worse. It was suggested that those who worked for a real improvement, should use the obvious means. The habit, the form of flower, and the foliage of some of the globosas were acknowledged to be beautiful. Size and colour therefore were the properties to acquire, and any flower that was larger and brighter, was the most likely to supply these. By hybridizing the Globosa therefore with the Fulgens, there would be a rational hope that among many there might be one or more with the Globosa form preserved and enlarged, and of the brilliant scarlet colour of the Fulgens, a suggestion which has been acted on some time, and from which we may fairly anticipate a change for the better, but we have many idle florists who like their work done for them, and who therefore place certain plants together, and leave insects to carry the powder from one to another, a work which the bee performs for them,

“By gathering honey all the day  
From every opening flower.”

This is an idle way of doing any thing, because although it sets nature's machinery to do the work, there is little credit to the cultivator, who, instead of applying directly the fertilizing powder of the one to the other, and so knowing from the result what such distinct operation produces, they take the chance, when it is well known to florists, that where the bee inoculates one flower with the powder of another, it inoculates fifty with its own powder, hence the great number which are like the parents themselves. Again, those who are too

idle to perform the delicate task, are not sufficiently industrious to make a selection of the seed, all that comes, no matter on which plant, is saved, and seedlings raised from it, and so as the coarse varieties or species seed the most, for we have hundreds which are mere varieties of these coarse kinds, rendered worse if at all changed by making the fine scarlet into a brick-dust colour, increasing the length of the points of the sepals, shortening the tube, without making the texture finer, and coarseness is one of the faults which is too generally the accompaniment of size, and almost universally the fault of seedlings raised from Fulgens: There are two other glaring faults in Fulgens, which were only tolerated on account of the great claims it possessed in other respects, one is the green points of the sepals, which has an unfinished ugly unbloomed appearance, the other is the colour of the corolla is the same as that of the sepals, whereas it is obvious that in a flower like the Fuchsia, there should be at least as strong a contrast as the approved varieties possess, and whose purple corolla form a pretty relief to the sepals. The only proper method therefore of hybridizing, is to pick out such of the varieties as possess these properties in the highest perfection, and fertilize these with such as possess the quality you wish to add to them. Take for instance, Globosa Major, or any or all the Globosas, for they are all good in their way; Ricirtoni which has a splendid corolla, and well exposed by the reflection of the sepals; Venus Victrix which has white sepals with a purple corolla; Formosa Elegans which is itself one of the best, and any others which are really of good habit and character, and with the pollen of Fulgens touch some of the stamens of each of the chosen varieties, marking the flower for the double purpose of seeing whether these identical flowers go to seed, and being able to gather them, and distinguish them from the thousands of flowers not so touched; you may have some hope of choice varieties, but we have seen batches of seedlings saved from Fulgens, without one better than the parent, and ninety-nine of a hundred worse. The real object of hybridizing being to produce flowers which possess several good properties from two kinds which possess only half each, the great care should be to save the seed from those which possess the most important property, and fertilize them with the kinds which possess properties you would like to add; thus in the Rhododendron, we take the hardy kinds to save the seed from because that is the grand property, and fertilize them with every sort of which we desire the colour or the size, or form. So also with the Fuchsia, as the most important properties are the habit of the plant, form of flower, and colour of co-

rolla; we select the sorts which possess these, and fertilize them with others which possess size and brilliance of sepal; we have no hardy ones, or we should begin assuredly with them, however ugly they might be, because any improvement you can make in a hardy plant, is a wide step in advance. The effect of hybridization generally, so far as our experience goes, is to preserve more of the habit of the plant from which we save seed, than of the plant we fertilize with. Therefore in all cases we begin by saving seed from the plant which possesses the most valuable property. Suppose we were working for improvement in Panseys, we should select that which had the leading properties of roundness in the flower, thickness of the petal, and smoothness of the edge, although there were not one good point in the colour. But as these flowers seed well generally, people are apt to merely select the largest without reference to other points; and so captivating is the one quality of size, that hundreds, which possessed no other property, have been named and sent out as new varieties. Again, instead of paying any attention to a few good sorts, most people have saved seed from their whole collections, or from flowers bloomed among their whole collections, which is nearly as bad. The natural consequence of this is, that they have had frequently to go over hundreds, if not thousands, to seek for such as were, in their opinion, worth saving, and thus given themselves great trouble for little advantage. This is not hybridizing; it is trusting to mere chances without using the means that are in our power. Take half a dozen of the best flowers you can find, with distinctive characters, and if you are too idle to impregnate the one with the other, place them close together, as far removed as possible from all others; mark as they come out the most perfect flower from each, and pick off, as they come, all those which are less perfect, and you will stand a much better chance of good seedlings than you can amongst large collections where there are inferior varieties. Above all things avoid saving seed from those with thin petals, notched edges, and flowers not round and flat. But those who mean really to hybridize should not only select the flowers to seed from, but also the flowers whose qualities they wish to impart to them. One of the most remarkable, and, as things are at present, the most scarce and valuable properties, is that of having the three under petals the same pure white or pure yellow ground. Not merely nine out of ten, but ninety-nine out of a hundred of yellow grounds have the two side petals lighter than the bottom petal; and more than nine out of ten of the selected named varieties have this fault—a fault which some of the growers will not acknowledge, but it is easily accounted for.

Such is the prevalence of this condemnatory feature, that when first the subject was seriously broached it would have thrown out nine-tenths of the then approved varieties. The great charm which was in the eyes of some to supersede all others, was the eye, and the darker and larger this came the more did it please the growers of the day, and the more did it blind them to all other faults. Now we maintain that the eye is only a *beauty*; it is not a *necessity*. A flower may be a valuable addition to our present collections without possessing that quality at all. It does not form such an important feature as to prevent a flower taking rank with the first class. Nor does it possess sufficient attraction to cover any material deficiency. White ground flowers cannot be too pure; yellow ground flowers cannot be too brilliant. Therefore, although to get thickness and smoothness of petal, and roundness and flatness of form, we could put up with ugly and ill-defined colours and absence of eye in those we intend to seed from, we should fertilize with the pollen of those only which possessed the other requisites, for the chance of procuring the properties of the parent from which seed is saved, and the additional properties of colour and character which are possessed by other varieties. If you are determined to let a few hybridize themselves, the principal object to attend to is to get a dark self, a yellow self, a white self, a good yellow ground with dark marking, a yellow ground with light marking, a white ground with dark marking, a white ground with blue marking, and two or three remarkable for thickness and flatness of petal. These must be bloomed where none others are near, and only two or three pods of seed saved from each plant, and they from the largest and most perfect flowers only. The disposition to sport, or run one into the other, alone renders this plan tenable; for in some plants you will stand no possible chance of success unless you actually apply the pollen of one flower to the seed vessel of the other. There has been at present recorded no attempt to hybridize the hardy convolvulus with any of the tender ones; nor do we know that they are nearly enough allied to bear it; but it would be worth attention. There is no knowing how far the common bell bine, which no frost will kill, would fraternize with some of the gay Ipomæas. We are not now calculating how nearly they are alike, or whether a botanist would hold out any hope of such a partnership. The truth is, that for practical purposes botanists are of small service and their lessons very useless. The more abstruse they get, the less service they are and the more they differ from themselves and from each other. There is nothing like trying; and as all hybridization has been carried on in opposition to

them, and they have even lectured against it, they do not much relish being obliged to adopt and describe, and even admire hybrids, after having unmercifully condemned both the hybrids, and the people who produced them, as destructive of species and damagers of even the generas themselves. When Smith, of Norbiton, laid the ground-work for producing his hybrid from *Azalia Sinensis* and a *Rhododendron*, by which we had his beautiful yellow variety, and of which he has a very pretty stock ready to send out, he never consulted botanists at all, and if we saw the most remote chance of hybridizing a hardy convolvulus with anything, even as unlike it as the *Azalia Sinensis* was unlike the *Rhododendron*, we should, try all manner of experiments, for the mere chance of success. It is a grand accomplishment to a hardy flower to obtain the beauty of the tender ones; and if we observe the many varieties of *Ipomæa*, and convolvulus-shaped flowers, it is more than likely that some may be sufficiently allied to accomplish all we want. There are many shrubs, and trees, and flowers, that are worth this experiment. So far as great variety and beauty are concerned, there is a wide field open for hybridizing in the *Magnolia*; some of the smallest varieties may be hybridized by the largest, and the largest with the smallest, with every probability of a beneficial change. The *Magnolia fuscata* is a green-house plant, and highly scented, and another variety, of which we forget the name, is still more highly odorated; these would be good subjects with which to hybridize any, or all the hardy specimens. No doubt, some would take the fertilization, and the produce would be, in all probability, improved in scent, altered in appearance, and some, at least, hardy. But we are indebted more to accident than anything else for one-half the new things we produce. The *Potentilla Hopwoodiana*, which is almost the prettiest of the tribe, was a self-sown seedling, or a sporting branch of another variety; but we feel confident it was the former. Mr. Hopwood, of Twickenham, discovered it in a bed, which contained both the scarlet and yellow varieties; and the habit and colour are so like a cross, that we have not the smallest doubt of its being a seedling plant; this is only one of hundreds of similar discoveries, or plants raised without any previous attempt or intention to produce anything out of the common way. We expect to see something of a decided novelty between *Salvia palins* and the old scarlet, but nobody seems to be working for it; they are grown together on the same borders, and some day seed will be gathered, and hybrids produced, without the raiser deserving any credit for it. But in a tribe of plants, in which there are so many colours, habits, and grades, from perfectly hardy to

stove plants, there is much to be done. The *Gloxinias* have offered this temptation, and some very pretty varieties are the consequence; the best, however, is one of Mr. Mountjoy's, shown last year, 1843, at the public exhibitions, and now sent out deservedly as a new *Gloxinia*. It would puzzle us to say what colour it is, but the flower is large and showy, and the plant of pretty habit. The *Clematis* is another tempting subject, we have white, blue and white, and rosy purple; it is impossible to say what might not be done by hybridizing. *Sieboldii*, with *Azuria Grandifloræ*, and any of the stove and greenhouse varieties, with the hardy ones. When we have such great choice in the introduced species and varieties, there may be much done in a short time; but when we are obliged to seed from one species only, and watch annually for any better change that may be found among the seedlings, throwing the others away, and seed from the one which shows only this trifling change; it is a work of time before we break fairly away from the origin; this once done, and we soon multiply the shades; although, according to the morphologists' notions, that flowers are only leaves, we turn green into all manner of colours. The *Petunia* is now rapidly multiplying its varieties, and Mr. Miller, of Ramsgate, has given us *Picta*, which is a decided advance, because it is beautifully mottled. Mr. Girling, of Stowmarket, has as many striking varieties as will enable him to send out whole collections, some mottled, and varied like the *Salpiglossis*, and with more colours; others, Self, with dark throats, from deep red to light lilac, and some white, but many greatly improved in form. But the most remarkable hybrids of late years are the *Calceolaria*, which Mr. Green, gardener to Sir E. Antrobus, was the first to bring into notice, and which is now rapidly multiplying to all sorts of forms, colours, and markings. However, a gay flower, produced from two very insignificant and (one of them excessively) ugly origins, and now forming the most showy part of our exhibitions. But here, the whole thing has been spoiled through sowing so much seed from herbaceous varieties, instead of shrubby; and we have to thank the wisdom of the Horticultural Society for this evil, for they were wise enough to give prizes for herbaceous kinds as well as shrubby. We advise all those who intend growing *Calceolarias* to buy none but shrubby ones, and grow none but shrubby; and if among their seedlings they find any herbaceous to either, throw them away altogether, or put them in a house or frame, as far off as possible from their best. If they find any wonderful flowers among the herbaceous, let them fertilize a shrubby one with it, but never save seed from them; how-



ever, we have prolonged this article beyond our prescribed limits, and must, for the present, close.

#### INJURIOUS INSECTS.—No. II.

The Small Ermine Moth (*Yponomeuta padella*).

THIS moth is nearly one inch in the expanse of its wings, the upper pair of which are of a leaden grey colour, with about thirty black spots, somewhat regularly placed in longitudinal rows, but on the hinder margin they are more irregularly, and rather transversely, disposed. The lower wings are of a darker leaden colour, and with thick fringes. Some variation in the colour and number of spots is observable, however, in different specimens. Their colours, and their abundance, commonly render them so conspicuous, that they rarely escape notice, either when they are flying about and across the trees and hedges, or when resting on the branches.

At about the end of July, the female deposits her eggs on the branch of some bird-cherry, apple, cherry-apple, plum, white-thorn, or black-thorn. Having laid her eggs she spreads, by the aid of her tail, a gummy matter over them, and this coating, when dry, forms a thin shell or plate, about the eighth of an inch in diameter, and serves as a screen to the caterpillars when they are first hatched, and are in a weak and tender state. Just when the leaves are appearing on the following spring, the caterpillars leave this plate of gum, and creep into the leaves, eating the cellular tissue, but leaving the epidermis or outer skin untouched. When they have attained a larger size, they devour their way through the epidermis, and escape out of the leaf. Up to this period the leaves will have borne a brown appearance, caused by the caterpillar eating up the inner portion; but, now, the caterpillars are observed in thousands upon the leaves, and the gardener, who saw nothing of them, when they were inside the leaves yesterday, persuades himself that they have fallen down in a shower, or have been blown from some distant country. The body of the caterpillar is smooth, of a greyish colour, with several black spots, of which the largest form a row on each side. Its head is brown.

The caterpillars keep close together in great numbers, spinning one common tent, or web, over the small branches or twigs of the trees or bushes, and then, while thus under cover, commence eating the parenchyma of the upper sides of the leaves, which are beneath the web. Having eaten as much food as was to be obtained under the web, they go off to another part of the branch, and construct a new web over some fresh leaves. During the existence of each band of caterpillars, they construct

half a dozen or more of these thick webs, eating the leaves they enclose; so that, at midsummer, instead of fine orchards and hedges, the gardener sees nothing but leafless trees, covered with thick webs. The leaves being half eaten, either shrivel up or fall to the ground; the young branches wither for want of sustenance; and the tree altogether looks as though it had been scorched.

“With respect to such caterpillars as feed on different plants, Reaumer and De Geer make the singular remark, that in most cases they will only eat the sort of plant upon which they were originally hatched. We verified this upon two different nests of these caterpillars, which we took in 1806, from the bird-cherry, at Crawfordland, Ayrshire. Upon bringing these to Kilmarnock, we could not readily supply them with the leaves of this tree; and we tried them with almost everything green in the vicinity of the town, but they refused to touch any thing which we offered them. After they had fasted several days, we at length procured some fresh branches of the bird-cherry, with which they gorged themselves so that most of them died. In the summer of 1829, we again tried a colony of these caterpillars, found on a seedling plum at Lee, in Kent, with black-thorn, hawthorn, and many other leaves, and even with those of the bird-cherry; but they would touch nothing except the seedling plum, refusing the grafted varieties. A circumstance not a little remarkable in so very nice a feeder is, that in most cases the mother moth will deposit her eggs upon exotic trees, and not even of the same genus with her usual favourites. Thus, in 1825, the cherry, apple, or Siberian crab (*Pyrus prunifolia*), so commonly grown in the suburbs of London, swarmed with them. On a single tree at Islington we counted above twenty of their nests, each of which would contain from fifty to a hundred caterpillars; and though these do not grow thicker than a crow quill, they scarcely left a leaf undevoured, and, of course, the fruit, which showed abundantly in spring, never came to maturity. In the summer of 1826 they were still more abundant on the hawthorn hedges, particularly near the Thames, by Battersea and Richmond. In the summer of 1829 we could only find the single nest, upon which we tried the preceding experiment. In the spring of 1830 they again appeared in millions on the hedges.” (*Insect Transformations*, p. 205). In the summer of 1837 they abounded on the apple trees at Walworth, and many other places about London; and in the neighbourhood of Paris they were also extremely numerous, and committed the most extensive destruction.

When the caterpillars are mining between the skins of the leaves, which then present a

burnt appearance, the leaves should be picked off and burnt. When they have grown larger, and begin to feed on the exterior of the leaves, their webs, enclosing the caterpillars themselves, should be picked off with the hand, if not too numerous, and the insects should be destroyed, taking as much care as possible to prevent their escape. If, however, the webs are exceedingly numerous, let some soap suds be forcibly pumped upon them by a garden engine. Mr. Main recommends a solution of ivy to be pumped upon them, and implies that they dislike its qualities.

About the beginning of July, the caterpillars transform into chrysalides inside their webs, and they generally undergo this transformation simultaneously. Each chrysalis is also enclosed in a long cylindrical cocoon of white silk. These cocoons usually lie side by side under their silken tent or web. If a cocoon be ripped open, a bright chesnut-coloured chrysalis will be found within it. In about three weeks the chrysalides hatch and the moths are disclosed inside their cocoons, from one end of which they have to make their own escape, which they do while their wings are yet moist and unexpanded. When they have got out of their cocoons they rest a while, and their wings soon expand and become capable of flight. The gardener and horticulturist will do best to destroy these moths, which, by appearing simultaneously, cannot well escape notice. They may be easily beaten off the trees into a sheet by striking or shaking the branches. Let it be always borne in mind that the destruction of one moth is equivalent to the destruction of several caterpillars; indeed, it is often more so, for they are frequently not destroyed until they have perpetrated considerable damage. J. H. F.

#### ECHITES SUB-ERECTA, OR SAVANA FLOWER.

It having appeared to me that there was a great deficiency of accurate information concerning the actual plants which afford the bases of the powerful vegetable poisons named "Upas Tiente" (made from the juice of a tree called Antshar) and "Tshittik," in the East Indies; and those called "Ticumas" and "Woorara," (supposed by Mr. now Sir B., Brodie, to be the same,) in South America; and being strongly of opinion that one or other, of the latter at least, is derived from the plant which is the subject of this paper. I determined, when last in Jamaica, to make some experiments with the *Echites Savana* flower, or Nightshade, as it is there commonly called from its well known noxious qualities, and to which I was more immediately directed by the circumstance of some negroes having at that time been taken up for attempting to poison the overseer

of Longville estate, by throwing some of the powder of the bark of the root into his jar of drinking water, a portion of which powder was sent to me for analysis, and, being a vegetable substance, the *object* was best answered by administering it to some animal.

I am not aware that any botanical description, or figured illustration, has been published of any of those plants which yield the above-named poisons, and wherever I have seen them adverted to in books, it was in a very unsatisfactory manner. Orfila says little more than that they are obtained from plants which *climb* round others. Dr. Paris says, the *Upas Tiente*, of Java, is procured from a species of *Strychnos*, which is quite at variance with its being the produce of a large tree, called *Toxicaria* by Rumphius, and *Antshar* by Dr. Horsfield; the latter, when speaking of the plant which yields the active matter in the poison called *Tshittick*, says, "it is a large *winding* shrub, it has a diameter of two or three inches, and *attaches itself* to large trees, and ascends to the top of of them; it is prepared by making an extract in hot water from the bark of the root, by adding *Galanga*, onion, garlic, and pepper."

The *Echites sub erecta*, or *Savana Flower*, is so named in Jamaica, because it is found growing in great quantity in the savanas of that island, where it preserves its rich green foliage, and bears beautiful yellow flowers even in the driest season, and when there is not a vestige of vegetation to be seen any where around it; and very remarkable it is, that this lovely-looking plant is seen at those periods forming here and there a mere dot or speck of verdure, a sort of miniature oasis of vegetable life, when all else presents only the blank of death, from the effects of a burning sun and long-continued drought, it is then that the *Echites* is found flourishing conspicuously 'in immortal youth,' although serving apparently no useful purpose but that of gratifying the eye of one who may be unacquainted with its deadly qualities.

Brown, an eminent botanist and historian of Jamaica, says, 'two drachms of the expressed juice killed a dog in eight minutes.' Death having followed so quickly in this case, we have to regret the absence of details, showing the mode of administration and subsequent symptoms, it being presumable that the poison was retained either artificially (*Orfila*, in a great number of his experiments, tried the *cesophagus*), or through some other circumstance attending its exhibition, while in my cases the poison was simply mixed with ordinary food and eaten voluntarily by the dogs, but in each instance it was rejected in a *minute or two*, and followed by continued violent action of the stomach.

The fact adverted to in your notice of *Echites*, where some mules were killed by an infusion of the flowers, happened in this manner:—Some negroes were directed to collect withe, which is afforded abundantly by several of the climbing plants of the island, for the purpose of tying fences; they brought, by mistake, a quantity of the vine stems of the Savana flower, which were dropped inadvertently into an empty horse-trough; after a while rain fell, and nearly filled the trough; consequently the water became impregnated with the juices of the plant; the mules drank of it, and nearly the whole of them were speedily destroyed.

I may mention one more case reported to me by the late Mr. Richards, of the Bog Estate in Vere:—‘Three sailors went from the Salt River to the Alley in Vere to fetch a jug of rum; on their return the bung was dropt, and, as a substitute, they stopt the mouth of the jug with a handful of the Savana flower-plant, twisted together; the men afterwards drank of the rum, and two of them died.’

Horses, cattle, sheep, and goats, carefully avoid touching this dangerous plant, and seldom, if ever, suffer by it when in a green or growing state; but it sometimes happens that the negroes, when cleaning pastures, cut down the plant by accident, or from ignorance; in which case the dried leaves are apt to be taken up with the grass, and eaten by mules or oxen, which are invariably destroyed by them.

I have noticed several other species of *Echites* in Jamaica, growing in hedges, and bearing white flowers.

The results of the three experiments which I made with *Echites* may be given in a few words.

In the first, one drachm and a quarter of the juice of fresh leaves, although rejected in a few minutes, killed a dog in seven hours.

In the second, four grains of the powder prepared for the destruction of the overseer, although much deteriorated by the long exposure to alternate heat and moisture, made a dog extremely ill.

In the third, twenty grains of the powdered bark of the root, although *thrown up immediately after it was taken*, destroyed life in two hours and a half.”

With respect to the recent researches of Mr. Schomburgh, going to prove that the *Strychnos Toxicaria* is the chief ingredient in the composition of the Woorara, I would submit whether some misapprehension may not exist upon this point, as of the four species of true *Strychnos*, of which I have any information, three are natives of India, and one of Australia. It is to be remembered that the genera *Strychnos* and *Echites* are both pentandrous, scandent plants, and the species of each have been commonly termed nightshades.

One cannot but be struck with the odd mixture of heterogeneous matters which are named by different writers as being made use of in the preparation of these celebrated poisons, and which, as additions to the main ingredient, are all non-essentials as regards the effect to be produced. Mr. Waterton, when describing the manipulation of the Wourali, by the Indians, says, “A vine grows in these wilds called *Wourali*, hence the name of the poison, to which they add a bitter root, two bulbous plants, a large black, and a little red, ant, strong pepper, and the *pounded fangs* of the Labarri and Counacouchi snakes. The whole is considered as a gloomy and mysterious operation; women and girls are not allowed to be present, lest the Yabahou, or evil spirit, should do them harm; the shed under which it has been boiled is pronounced polluted, and abandoned ever after. He who makes the poison must eat nothing that morning, and must continue fasting as long as the operation lasts.” There has always been considerable affinity between the arts and practices of witchcraft and secret poisoning, in the mysteries and complicated nature of their operations, and where can be found a better illustration of this than in the admirable receipt of Mesdames Hecate and Co. for preparing their charm, as given by Shakspeare in *Macbeth*?

In fine, it is remarkable that neither Dr. Horsfield nor Mr. Waterton enable us to recognise the species of plants which yield respectively the Tshittik and Woorara, merely speaking of them as having a climbing character; on the other hand, I have only to offer the facts here related in proof of the *Echites*-suberecta yielding an intensely powerful poison, and that it is, at least, highly probable that it may be the principal ingredient used in elaborating the Ticunas or Wourali of South America. A knowledge of these particulars may contribute to cause the plant itself, which was first exhibited from the Worton collection, to be viewed with much additional interest.—W. S., Norbiton.

#### THE CULTIVATION OF THE CUCUMBER.

To avoid some of the accidents and thwarting circumstances which, at a very early season, gardeners have to contend with, and at the same time not to be too late, by choosing a sort of medium between the two, I would commence about the 1st of January. Plants properly managed from this period will come into fruit nearly, if not altogether, as soon as those which have been commenced three or four weeks before. Previous preparation of material for the seed-beds should be at all times a principal object, but more especially at this

season of the year, as much of after success depends upon the manner of its formation. Whether, therefore, it be taken from pine-pit linings, or prepared expressly for the purpose, it should contain no rank material or excess of moisture; indeed, towards the top, it can scarcely be too dry. By a little attention in this respect, I have invariably found the heat to be more lasting, less violent, and more steady; little or no steam is produced, which, although in some degree necessary, is nevertheless at this season highly prejudicial to the plants; and in many, too many instances, the cause of a premature death. The bed being finished, and a one-light box placed on the top of it, I fill in four or five inches of dry sand. This, besides raising the plant nearer to the glass, prevents the heat from operating too powerfully on the pots; it is less subject to damps than any other material, and should the weather prove favourable enough to admit of a slight watering overhead, which should always be done in the fore part of the day, shutting up the frame immediately after to regain its former temperature, the evaporation produced will be purer and more invigorating than from any material in a decomposed condition. It is also of essential service in carrying off all superfluous moisture, which is speedily absorbed, leaving a comparatively dry and healthy atmosphere for the plants.

I sow in forty-eight sized pots, which have been filled the day previous with a light rich soil and placed in the frame, so that the mould may approach to dry rather than damp, and be more favourable for the vegetating of the seeds. If the heat of the bed is not above eighty degrees, I plunge the pots to their margin, but the temperature being higher, they must be regulated in proportion. In three or four days they will be making their appearance, when it will be necessary to move the pots a little nearer the surface, in order that they may have the benefit of as much light as can possibly be given them, and prevent any danger there may be in having the roots injured by excessive heat. If the weather be close and mild, plenty of air should be given; but if sharp and clear, very little is necessary. The process of potting off should be attended to by the time they are three or four days old; there being less chance of injuring the roots when they are separated than were they allowed to remain longer in the seed pot. In performing this operation I use the same sized pots, and the same sort of compost, resting the seed leaf on the margin of the pot, and covering the roots nearly one inch deeper than they were before, adding occasionally a little fresh mould as the plants increase in strength. It is a common practice at all seasons, and in

whatever state or condition plants may be, immediately after potting or repotting, to saturate the soil with water. This practice I have for a long time abandoned, especially at late or early periods of the season, when at best we have not three days' sunshine out of the seven. Watering at this season of the year, and indeed at all other seasons, must depend in a great measure upon the degree of light and heat to which the plants are subjected, on the temperature of the atmosphere without, as well as on the temperature of the atmosphere within; in short, a careful consistency must be maintained between the four agents—earth, air, heat, and water; and unless this be carefully attended to, the influence of the one must as a matter of course counteract the influence of the other, and render every other effort all but useless. On the appearance of a bright day, with every probability of its remaining so throughout, water should be liberally administered, and every possible advantage should be embraced, and every circumstance or combination of circumstances laid hold of that may in the smallest contribute towards the plant's progression.

I stop them above the first rough leaf, and at almost every succeeding joint, so long as the plants are able to mature a single fruit; but of this we will have occasion to speak hereafter. In preparing the fruiting bed or pit, let them be kept equally dry, as recommended for the seed bed, finishing it on the top with a covering of leaves, three or four inches deep, in a half decomposed condition. They will answer the purpose much better if they have not been exposed to the winter's rain. I have grown them in different sorts of mould with nearly equal success; but that which I consider preferable is a light loam from an old pasture, adding a fourth or fifth of leaf mould, and nearly the same quantity of well decomposed dung. If the loam be of an adhesive nature, I prefer lightening it with heath soil instead of sand, there being more nourishment in the former, and will keep it nearly as open as the latter. The hills I fill in to the depth of fifteen or eighteen inches, and as soon as there is sufficiency of heat the plants should be trilled out. The temperature of the frame, however, must be regulated according to the quantity of light without. If dull and damp, with little or no sunshine, from 65 to 70 degrees, will be sufficient; but if the atmosphere be hard and dry, with bright sunshine, 70 degrees for the minimum will not be found too much, and from 80 to 85 for the maximum, allowing it only to rise to the latter, after shutting up the frame, when the plants have had a slight watering overhead. I take care to have the plants moderately moist at the root before per-

forming this work, in order that they may require no water immediately after. On the first appearance of the roots through the hills, an additional moulding should be instantly attended to, for if this is neglected, they will push downwards, and imbibe unhealthy nourishment, which will materially retard their progress, and if not timely prevented, will ultimately lead to premature decay. Great care and frequent examination is necessary, to prevent any tendency in the bed to burn. I am fully persuaded, that in most cases where accidents and failures are attributed to the effects of steam from the lining, that the injury arises solely from excessive heat in the bed, by which impure and unhealthy vapour is produced, equally dangerous, and perhaps more fatal in its consequences, than the steam of a rank lining. After the moulding has been completed, the roots will soon reach the extremities of the pit; and, at this stage, I found it difficult to maintain a sufficiency of heat in the lining without a continual dread of injuring the roots. To remedy this, I procured boards the exact length of the pit, and eighteen inches deep. These I placed round the bed, keeping the upper edge a little under the surface of the mould, and leaving a space between them and the brick work for the admission of heat. By this means I could command any degree of heat that might be required, without the slightest danger of injuring the roots. The same method I practise in growing early melons, with good success; and I mentioned in a former part of this paper that I topped the plants for the first time above the first rough leaf, and almost at every succeeding joint afterwards. It is the custom of many individuals to allow their plants to cover the entire bed, without ever topping them at all. A moderate supply of indifferent fruit may be obtained for a week or two by such treatment; but, owing to the plants' rapid growth, the foliage becomes nearly all of the same age, and a deal of cutting is necessary for the purpose of making them produce fresh bines, which causes a considerable loss of time, and may eventually lead to canker and disease. On the other hand, when the plants are regularly topped as soon as the points can be conveniently pinched off with the finger and thumb, the small portion that is detached at a time can have no material influence on the health of the plant; and a successive supply of young foliage is constantly kept up, without which it were vain to expect healthy and vigorous plants, with a regular supply of good fruit.

In conclusion, strict attention must be paid towards removing all dead leaves, or decaying substances of whatever description, from the frame. It is a natural consequence in all vege-

table as well as animal matter, at a certain stage of decomposition, to produce insects and emit noxious effluvia; and when it is considered how small the space is in which plants are confined, and the little of anything of a deleterious nature necessary to vitiate it, it is not at all to be wondered at that the anticipations of the gardener are often disappointed. P. K.

#### THE THEORY OF GROWING FOR BRANCHES AND GROWING FOR BLOOM.

THE long and able arguments which have been carried on in the two garden newspapers upon the botanical theory that flowers are leaves, have no doubt had their admirers on both sides. Many hard words have been used, which there was no occasion for, and we have taken some pains to sift "the grain from the chaff;" that we may give an impartial statement of the case as it now stands. The *Outlines of Botany*, published by Dr. Lindley, contain assertions which imply that the petals of flowers are useless, that flowers are malformed leaves, and fruit stunted branches. Two or three papers in the earlier portion of this work, attack these assertions as impious and anti-scriptural. This caused a great sensation, and the Editor of the *Gardeners' Chronicle* considered it necessary to obtain a series of papers in defence of the, to some, offensive doctrine, which is called morphology, and accordingly the papers fourteen or fifteen in number, appeared: scarcely any of them, however, advanced a single fact in favour of the real question at issue, or indeed one that was not admitted at once as truths by the writer, in the *Gazette*, who saving us both the trouble and the necessity of even noticing the controversy, followed out the views first promulgated in this work. Nearly all the papers in the *Chronicle*, were merely descriptions of changes that take place from eggs to birds, from seeds to plants, and chrysalis to butterflies, and chemical changes, none of which bore upon the point at issue; and so far as the Editor of the *Gazette* was concerned, none of which were disputed. At length came the only things that were directly in point, and that was not so well said, nor so plainly, (though more elaborately communicated,) as it was in the original, "the outlines of Botany," which these fourteen or fifteen papers had to defend. The writer showed, that plants which were full of bloom buds had been known when excited, to grow into leaves instead of bloom, that flowers had been known to have part of their petals' leaves, and leaves had been known to be partly coloured like petals, though they were on parts of the branch far away from flowers; and it was assumed that this proved flowers to be only leaves in an altered state. Then, again,

it was shown that fruit had been known to have branches grow out of them, and assumed that this PROVED that the fruit was only stunted branches. These doctrines were ably, and seriously, and scientifically refuted by Dr. Murray, a writer, of great celebrity (whose name was originally connected with the *Gardeners' Chronicle*), who, in a masterly way, upset all the assumptions, upon which the German dogma was founded. The Editor of the *Gazette* met the *Chronicle* writer foot to foot, and blow for blow was dealt out, until his antagonist gave up the ground, and left his opponent master of the field. Without quoting any of the rough and ugly writings in their natural shape, we take the argument; the Editor of the *Gazette* admitted that plants, well set with buds for bloom, sometimes went to leaves, that flowers were sometimes found with leaves among the petals, and sometimes with a portion of a leaf like a petal; but that, as these were exceptions to the general rule, and no more extraordinary in vegetable nature than malformations were in animal nature, he denied that they proved anything. He observed that Mr. Lidgard, of the Thatched-house, Hammersmith, possesses a lamb, part of whose back has grown out into two extra legs. If, said he, leaves growing in flowers prove that flowers are altered leaves, the legs growing out of this lamb's back prove that lambs' backs are only altered legs. Then, with regard to flower buds growing into leaves, which is a little more startling at first, he says, plants have, in every part, the embryo of leaves and of flowers, even in the stumps which have not shown a leaf for fifty years, there are the embryo of both leaves and flowers; and, as a proof that these may be either dormant, or be excited, he said, let the head of the tree grow for half a century, and the dormant embryo of leaves and bloom will remain so. Cut the head off, or prune it close, and some of the most prominent of the dormant leaf buds will shoot out. The reason is, that while the sap and energies of the tree can be all exercised in producing and elongating the branches of the head, there is no excitement for those in the trunk, but stop this, and it excites those which might have remained dormant as long as the tree lived. Therefore, when a plant is not over-excited, and has set for bloom, and has every appearance of blooming well if undisturbed, a sudden excitement brings forward the embryo leaves and branches, which are in within the buds, called bloom buds, as well as every where else, all the parts of the flower beginning to form, shrivel and die, and the embryo branches being capable of taking up all the sap and energies directed to them, grow rapidly, while the most that can be seen of the parts of the flower

blighted and shrivelled up, would be very minute scales, almost too minute to notice, or very small dusty matter, which blows or falls away. This is the *Gazette* answer to the points most relied on by morphologists, which are thus completely overthrown. We never intended to touch upon this question, but a subject which one person — the Editor of the *Gazette* — has been almost the only one to battle with professors about, and which has been almost the leading article in the two garden newspapers for some months, tempts us a little more than we expected. However, we shall simply say, that as a proof that there are the embryo of blooms and branches in every part of a plant, that is, of the surface of a plant, we may mention that we have seen *Rhododendrons* start for growth after the bloom was so forward, that not more than two-thirds of the head of bloom were blighted, and fell off, in brown scales and dust, hardly noticeable, while some of the bloom in the same bunch actually came to their colour on the same head, although the branch went on growing. But we ought to give the *Gazette* argument complete. The Editor says, when the bloom perfects itself, the embryo of the leaves is blighted for some distance, and the unblighted embryo, nearest to the flower, grows. Thus, he admits, that a cultivator may, by management, excite either the blooming or the growing, but that there are, in all parts, the embryo of both; and that, with the exception of monstrosities (which, in the vegetable as well as the animal kingdom, will be seen occasionally), leaves and their embryo, and blooms and their embryo, are perfectly distinct and independent of each other. So much for an argument, into which we will go no further, but which has been ably conducted, and ought to be published separately. But as it involves the theory of blooming and growing we may derive some advantage from the conclusions to be drawn. The plain matter of fact, however it may be mystified by scientific crudities, is that when plants have matured their growth they bloom and fruit, and that until they are at maturity they will not bloom and fruit. In the open ground a tree is matured according to the excitement given to it. If it have very rich ground which is favorable for growth it will continue growing long and vigorously and not fruit. If it make less growth, in consequence of the ground being less exciting, it will come to maturity sooner, and fruit accordingly. This is illustrated every day by the barrenness of fruit trees, which, as the gardeners say, are going all to growth, and by the abundant fruiting of those whose season of growth is moderate, as soon, in fact, as the tree has grown itself to the place, and by that

means only, makes moderate shoots in a season, the balance of nourishment with what it has to do is complete, and when the leaves have done growing the sap thickens into food, for the embryo fruit and buds begin to grow. Trees and plants then may be artificially brought to maturity, by pruning or confining their roots an earlier maturity is produced; but if a tree, no matter how vigorously it grows, were allowed to mature itself in its situation, it would at some period bloom and fruit as freely as any of those which are artificially cultivated. But we have known a tree what is called "take to growing," instead of fruiting, and almost cover a house, and grow for years without producing a fruit; yet, just about the time that the owner was condemning it, some one mentioned this fact, saved the tree's life, and there was, in two years, an enormous crop, which continued, from season to season, to our knowledge for years. Sudden excitement or sudden check, no matter which, will frequently blight the embryo rudiments of flowers, the flower-buds, the flowers themselves, and even the fruit. In the earliest stages, when the rudiments of flowers would be scarcely perceptible if the buds were dissected, these rudiments, already very minute, shrink to almost nothing; and as there are no flowers and fruit to take the nourishment of the plant, the rudiments of branches, in the same vicinity, even within the very scales which formed the cover of the bloom itself, begin to grow, and the tree makes much more wood in consequence; but if the blooms have advanced, the sudden excitement or check will make them fall off without shrivelling. This is observable in many sorts of plants whose flower buds if nearly perfected or nearly filled by the advancing flowers, will fall off whole, if backward, the rudiments of the flowers decay with it, and the leaf buds advance. Witness the *Camellia*, which will, if the flowers be advanced beyond a certain stage, fall off; if not advanced beyond a certain stage, the branches will grow through the buds themselves. The great point to attend to in the blooming of plants is to grow them well, and when they have perfected their season's growth, let them rest in a lower temperature and with less water. This will excite the rudiments of flowers and fruits, which, if not checked nor suddenly excited, will perfect themselves. There are no rules which can be made apply to all plants. The extraordinary variety of form, figure, habit, and internal locality, prevent it; but these remarks apply to all familiar flowering and fruiting plants. The *Camellia Japonica*, and the *Rhododendron*, are frequently made to have two seasons of growth in one; that is to say, when they have completed a season's growth, and indicated bloom, fresh excitement is given,

they are well watered, and, by these means, the rudiments of bloom are blighted, the embryo branches come forward instead, and a complete new growth, of as much as would have grown the second season, is made during the first. This with meadow or small plants, which every body who deals must wish to make the most of, is an object.

#### DECANDOLE'S VEGETABLE ORGANOGRAPHY.

THE more botanists become acquainted with Decandole the better, they will learn from this how little we owe to our own fashionable writers upon any botanical subject. There are some who possess great facilities for appropriating the wits of other men to their own use; and these seem to be the people chiefly attacked with the rage for bookmaking. Decandole has furnished the ideas, which others have brought out fresh as their own writing, and the more his works become familiar, the more this will be seen. We hold copyists of men's ideas in great contempt. We can say earnestly—

#### *Imitatores Servum Pecus.*

But to our point, Decandole's Vegetable Organography has been admirably translated by Mr. Boughton Kingden, and having been completed in parts, and since bound in two volumes, we hope it is in many people's hands. Those who delight in the intricacies of vegetable structure, and the mystifications of botanical theories, should go to the fountain head, instead of attending to the second-hand stuff, which is vamped up into books, presumed to be originally English, and written by the authors, whose names they bear. On first reading Decandole, and afterwards wading through his imitators, the idea of an additional line for their title pages suggests itself forcibly, so much so, that we have half-fancied we saw, in small capitals, over the portion which informs us who professes to be the author, the words—

"MANGLING DONE HERE;"

then the following words, "by, &c." come in well. The following extract from Kingden's translation of Decandole's Vegetable Organography—the work under notice, will give a good idea of the style, and of the subject.

*Of Vegetable Structure in General.*—The intimate structure of vegetables, viewed under very powerful microscopes, offers very little diversity. Plants, the most dissimilar in their external appearance, resemble each other internally in a truly extraordinary degree; all their organs present in the interior but one tissue, of a very homogeneous nature, and

which seems composed of parts, the structure of which, in one plant, scarcely differs from that in another, and the absolute dimensions of which are, by no means, in conformity with the whole size of the vegetable. Grew, who had first made this observation, has given to these parts the name of Similary Parts, because, of this great resemblance, which they present throughout the whole vegetable world. Sénebier has named them Elementary Parts; and I have adopted this last designation on two accounts; first, because it describes better the part which these organs perform in the vegetable economy; and, secondly, because the term used by Grew is not strictly in accordance with truth in the present state of the science; and, without doubt, it will always become less, so as we dive more deeply into the mysteries of vegetable organography.

Every one knows that organised beings are composed of solid and fluid parts; or, to speak in a more general manner, of tissues, which form the body of beings; and of substances received into these tissues, or secreted by them. The first are those which constitute the peculiar nature, the life of the being: these are the elements, the modifications of which determine the afflux and the nature of the fluids; they are those alone which form the object of anatomy, and with which we shall here occupy ourselves. As for the substances deposited, or the fluids, their particular study belongs to physiology, and we shall only speak of them here incidentally.

The study of the elementary organs of plants was commenced about the end of the seventeenth century, a little while after the invention of the microscope. Grew, in England, and Malpighi, in Italy, nearly about the same time, commenced the examination of vegetable tissue, availing themselves of the assistance of this invaluable instrument, and observed all its parts with more or less precision. Thenceforth, this study was continued by Leeuwenhoeck; afterwards, about the middle of the eighteenth century, Gleichen, Needham, and some others, began anew to apply themselves to it. Hedwig, again, enlarged its boundaries, either by his genuine discoveries, or by his ingenious hypotheses.

In our own time, Mirbel, Link, Treviranus, Sprengel, Rudolphi, Kieser, Dutrochet, and Amici, have published very minute examinations of the vegetable tissue, and accompanied them with drawings both numerous and accurate; but the necessity of continually employing in these researches an instrument so difficult to manage well as the compound microscope, rendered abortive the dexterity of these observers. The minute anatomy of vegetable structure is still, in the more fundamental

points, in a state of uncertainty discouraging to the friends of the truth. "If anything," says Dutrochet (Mem. Mus. 7, p. 385), "can prove the uncertainty of our information upon vegetable organization, it is the *difference of opinion existing amongst naturalists* upon this subject." There is, in fact, hardly any point in vegetable anatomy upon which we do not find that those who have devoted themselves to it with the utmost care, *are divided, not only upon the theory, but even upon the facts*, which, one would think, observation should immediately decide. The contradictions of observers of these points are so great, that it is not an unfrequent occurrence for several persons viewing together the same fragment with the same microscope, to see, or to think they see, different appearances. For a much stronger reason are separate observers unable to understand each other upon the most simple facts. For fear of seeing these discrepancies multiplied, we conclude by distrusting our own eyes, and by fearing to affirm anything concerning what we believe we have seen. I shall endeavour to develope on this occasion, with all the caution which the obscurity of this part of the science demands, what appears to me most worthy of attention. I shall report with care the opinions of various observers, in order to endeavour to understand well those points upon which a difference exists, and those upon which they are agreed. But before entering into this exposition of the doubts and the uncertainties of microscopic anatomy, I would first inform beginners that these doubts have much less influence than might be believed upon the whole of the science. I will also say, in concluding these preliminary observations, that the precautions which have always proved the most sure for avoiding microscopic illusions, are—

First. Never to observe an object of considerable size, without having commenced the observation with glasses of weaker power, so as to follow it in a gradual manner from the lowest to the highest degree of enlargement.

Secondly. To view the same object with microscopes of different constructions, so that one may destroy any illusion which another may have produced; by these precautions the number of facts which are affirmed is perhaps slightly diminished, but more certainty is given to them.

When a transverse section of a plant, or a part of one, reduced to a thin and transparent slice, is examined first with a lens, and afterwards with a microscope, we perceive unequal cavities, sometimes round or angular, and most frequently hexagonal. If a longitudinal section be made, we always find the cavities closed by diaphragms; frequently there are other tubular cavities without transverse divisions, and



sometimes widely scattered filaments more or less opaque. The entirely closed cavities have been called *Cellules* or *Utricles*; the tubes, *Vessels*; and the filaments, *Fibres*.

If we now survey the various opinions which have been formed upon the structure or general organization of vegetables, we see that all the systems of phytotomists may be reduced to three principal ones. Some, after the example of Theophrastus, and perhaps of Grew, have thought that all the vegetable tissue is formed of very minute fibres differently interwoven. Others—and Mirbel appears to be the first who ventured the opinion in a general manner—believe that it is a perfectly continuous membrane, the various doublings of which produce the closed or tubular spaces which we observe. Lastly, most modern observers, following that which appears to have been the opinion of Malpighi, admit that vegetables are essentially composed of *cellules* or *utricles* differently joined together, and of *vessels*, which, by different modes of development and cohesion, form all the organs.

The comparison of these three theories will naturally lead to the exposition of the facts upon which we are about to enter; passing in review—

- 1st, The Cellular Tissue.
- 2nd, The Vessels.
- 3rd, That which is called the Fibre of plants.
- 4th, The Epidermis, or Cuticle, which covers all this apparatus.

Short as this extract is, it is full of meaning. There is enough in it to show, that vegetable physiology is rather less understood than the flippant and positive writings of some authors would lead us to suppose, and that, for the most part, it is very unnecessary to the full enjoyment of a garden. Whether we shall ever extract from the work before us the chapters on "the Cellular tissue," "the Vessels," "the Fibre," and "the Epidermis, or Cuticle, which covers all this apparatus," is doubtful, but those who want to learn should consult this book in preference to all others. It is all useless to the mere gardener, and we do not profess to make philosophers.

#### THE APPROACHING GREAT DAHLIA SHOW.

FOR the first time since Dahlias were introduced, and at a period when many people fancy they have declined, we have advertised, for the 25th of September, an extensive exhibition of Dahlias, liberally patronised by the trade, of whom fifteen have already subscribed five guineas each, and many others are expected to join—as to be out of the subscription and show is to be, in fact, out of the Dahlia trade. We

mention this approaching show for two reasons—first, because we are glad to recognise an effort to revive—if indeed the Dahlia requires reviving—and secondly, because, according to the prospectus, the plan is precisely that which we have, in an earlier part of this work, so strongly recommended in the articles on the management of shows. There are to be ten prizes in each class, and the reduction in value from first to second, second to third, and so on, is but a few shillings. Thus, instead of the prizes in any class being run away with by three head growers, the fourth prize, and all below it, will give six people an interest in the competition. At ordinary shows (and it is that which we have always contended against) there are but three prizes. Now whether we look to the nurserymen's class or the amateur's, about two or three persons could be pointed out who would be all but certain winners. What encouragement is there then for those not quite so good to enter, and pay their money, for the honour of being beaten? It is this, the utter hopelessness of every body's chance but those of the two or three best growers, that for the most part confines the entries to three or four persons, while the fact of there being provision made for ten winners encourages twenty or thirty to try their hands. There are two novel features in this proposed show. The one is a class of the best six blooms of new flowers let out in 1844; and the other is a class of the best six fancy or border flowers, which means, in fact, those extraordinary tips and stripes of which the French are so fond, and which, as garden varieties, are far before the selfs and edged flowers peculiar to shows in general. This has given a spur to the trade in border flowers, a class so well adapted to dressed ground and flower-beds, as to beat in appearance, however rough and ugly they may be, all the heavy self-colored flowers in the country. The only anxiety we have at all about the shows is the appointment of judges, for on that, and their rigid adherence to the proper principles of judging, depend much of the success attending this—we now hope and presume—annual exhibition. That it will be attractive we have no doubt, provided a good place is selected for the exhibition. It ought to be not far from town, if not in it. It should be easy of access, light, well covered-in, to provide against weather, and offer convenience for that which should always accompany a thing of the kind—a good dinner for people a hundred miles from home. If there be any one thing that takes away from the interest of a show it is the absence of a dinner. People who live on the spot, and have, perhaps, made up parties at home, little think of those who come long distances, and who, for want of something to bring

them together, are straggling about, some at one place, some at another, but all unsettled and uncomfortable. The prizes in each of the principal classes of the show now under discussion, are 100s, 90s, 80s, 70s, 60s, 50s, 40s, 30s, 20s, 10s. The smallest classes are 50s, 45s, 40s, 35s, 30s, 25s, 20s, 15s, 10s, 5s,—a respectable series worth any man's trying for, and giving every body who can produce flowers, without showing eyes, a very good chance of winning. All we hope is that the judges will stick to the properties, and all the showers be made to expect their fate whatever it may be.

#### THE PALMS.

THE natural productions of the *Palmaceæ* are so various and important, that a brief notice of some of the more remarkable species cannot but prove interesting to those who are unacquainted with the nature and properties of this family.

*Phoenix dactylifera* is a lofty palm, with leaves, when fully grown, from six to eight feet long. The fruit of this tree is the well-known date, which forms so common an article of food among the inhabitants of Egypt, Arabia, and Persia; it is stated indeed by Dr. Clarke, that they subsist almost entirely on this fruit, of which the quantity borne by each tree is prodigious. A single date-palm will bear more than a hundred weight, and not unfrequently between two and three hundred weight, of dates in a season. They begin to bear fruit when about seven years old, and are said to be fruitful for upwards of two hundred years.

*Corypha umbraculifera*, the majestic talipot palm, is a most remarkable species, and is thus described by Knox, in his History of Ceylon, of which country it is a native:—"As big and as tall as a ship's mast, and very straight. The leaves are very large, some capacious enough to cover from fifteen or twenty to thirty or forty men; these are of great use, for being, when dried, very strong and limber, though very broad when open, yet they will fold close like fans, and are then no bigger than a man's arm. The whole leaf-spread is round, but it is cut into triangular pieces for use; these the natives lay upon their heads when they travel, with the narrow end foremost, to make their way through thickets. The soldiers there all carry these umbrellas, not only to shade them from the sun, and to keep them dry in case of rain on their march, but when set on-end, to make tents for them to lie under. A magnificent crown of these leaves, as is usual with palms, terminates the stately column, 100 feet in height, which is formed by the trunk. The talipot bears no fruit until the last year of its life, and then yellow blossoms, most lovely to behold, but smelling

very strong, come out on the top, and spread abroad in great branches. The fruit is in such abundance, that one palm will yield seed enough to stock a whole country; the berries are round and hard, the size of our largest cherries, but not good to eat. The trunks, when young, are full of a mealy pith-like substance, which is beaten in mortars, and cakes made of it, that have very much the taste of ordinary white bread. The leaves are used instead of thatch for roofing houses, and also for writing on with an iron style. Most of the books shown in Europe for the Egyptian papyrus are made from the leaves of this palm.

There are other species of *Corypha* which are also plants of great importance; as *C. Taliera*, a magnificent species growing in Northern India, and applied by the natives to various economical purposes; *C. rotundifolia* is valuable for the amylaceous food (a kind of sago) which it produces; *C. cereifera*, a native of Brazil, yields a wax-like matter, to which its specific name, *cerifura* (wax-bearing), refers.

The genus *Cocos* is one of immense importance to the inhabitants of the countries in which it grows. There are several species, but the most remarkable and indeed the most valuable, is *C. nucifera*, the cocoa-nut palm, a native of, and cultivated extensively in, many tropical countries. Its simple, cylindrical trunk grows to a great height, crowned at the top with its fine clustered leaves, which are often ten, twelve, and even fifteen feet in length. The flowers are also produced in large clusters around the top of the stem, succeeded by large nut-like fruits, twelve together. These nuts are too well known to require any description; they afford an abundance of food, and the milk contained within the hollow kernel is considered a most refreshing beverage. The pericarp or husk which invests the nut is also of immense value; it is about an inch thick, of a fibrous texture, the fibres of which, being tough and readily separable, are manufactured by the natives into cords, cables, and various kinds of cloth. Of these fibres also, as well as those of the leaves, they fabricate mats and carpets of a beautiful and costly quality. The shells are converted to various useful purposes by the natives, who form them into cups, bottles, boxes, and other articles both of ornament and utility. The kernel, when ripe, yields abundance of oil, which during the last few years has become an important article of commerce. The mid-ribs of the leaves are converted into oars; the leaves themselves are used in thatching and fencing; they are burnt as fuel, and from the residue is obtained potash. The unexpanded buds are esteemed as a delicacy: when these buds are removed a quantity of sap exudes, which is carefully collected, and sold in the bazaars under

the name of *toddy*. This juice, when fresh and unfermented, is a grateful and wholesome beverage; but as it contains a large proportion of sugar, it readily undergoes fermentation and produces an intoxicating liquor, from which is obtained by distillation a spirit called *Pariah arrack*. Lastly, the stem is rendered useful in various ways, when young, it yields a nutritious, farinaceous food, when old it becomes exceedingly hard, and is converted into a variety of utensils, weapons, &c. Swords and arrows made of this wood, will, it is said, pierce through iron cuirasses. It is used as timber for building and other domestic purposes; and transverse sections of it are frequently employed for constructing drums. There are other species of *cocos*, which are also converted to various useful purposes.

The genus *Areca* contains several species, one of which, *A. catechu*, is extensively cultivated in the East Indies. It produces the *betel-nut*, so generally used by the natives as a masticatory. A slice of betel-nut wrapped in the aromatic leaf of the betel-pepper, is very generally chewed like tobacco by the natives, whose mouths and teeth are deeply tinged by the practice. It is said, however, to preserve the teeth, to render the breath sweet, and to act as a tonic and stomachic. From the fleshy part of the fruit an astringent extract is procured, and sold as a kind of catechu. *Areca oleracea*, the cabbage-palm of the West Indies, has acquired its specific name from the practice of cutting off the young buds and cooking them like coleworts; as such they are esteemed a great delicacy. It is the loftiest of the American palms, rising occasionally to the height of 160 and even 200 feet.

The genus *Elais*, the oily palm, derives its name from a Greek word, meaning *oil* or *olive*. *Elais Guineensis* yields the well-known palm-oil, large quantities of which are imported from Africa. This substance is expressed from the fleshy pericarpial covering of the fruit, in the same manner as olive-oil is obtained from the olive. It is of a solid consistence, of a rich orange-yellow colour, and has an agreeable odour, not unlike that of the Florentine *orris-root*.

The genus *Sagus* is valuable as producing largely, though not exclusively, the well-known article called sago. When the trees have acquired sufficient growth, they are cut down, divided into convenient lengths, and the feculent pith in the centre carefully washed out with water; the water is allowed to stand for awhile; the feculent powder subsides, and when dried constitutes sago. To give it that granular form in which it is usually sold in the shops, it is made into a paste and passed through a kind of sieve. In this form

it is often called "pearl sago." Some of the finest sago of Molucca, is said to be obtained from *Sagus laevis*. Large quantities are stated to be procured from *Sagus farinifera*, but of inferior quality. According to Dr. Hamilton, *Saguerus Rumphii* produces remarkably fine sago. Indeed there are very few species of the palm tribe which do not yield more or less of this nutritive substance.

It would, however, take up too much space to enumerate and describe all the species of this noble family which are useful to mankind. It must suffice, therefore, to state that their productions comprise wine, oil, butter, milk, cream, flour, sugar, salt, and other articles of food of various kinds, and in prodigious quantities.

#### ON TEMPERATURE AS IT AFFECTS THE GARDEN.

SIR,—In a former letter\*, I attempted to show, that locality had more to do with the successful cultivation of delicate shrubs and plants than latitude, and that many effects for which the temperature is praised or blamed, we ought rather to attribute to the exposure or non-exposure of the locality to the wind. In this letter, I wish to resume the subject of temperature;—but principally for the sake of showing that it might be of some advantage to gardeners, were they to follow the excellent advice given in the "Book of the Farm," to the young agriculturist, namely†, "to observe facts, and to familiarize themselves with them, as, when accumulated, they form the stores from which experience draws its deductions."

The frost in May last, is of too recent occurrence to have escaped even the most treacherous memory,—and as regards past weather and bygone seasons, the memory of man is most treacherous,—and here at least its occurrence ought to be long remembered, for many have lost their stock of Dahlias by its inopportune appearance. To my observation of facts, and my regular record of them, am I alone indebted for the preservation of my Dahlias. I remembered that in the middle of May, last year, we had frost, and I kept my Dahlias under mats at night until the first week in June. When the frost came, I looked back in my book, and found that in 1843, we had a similar frost on the 18th and 19th. This year it came on the 18th also, and continued over the 19th and 20th. In May 1842, we had no actual frost, but the nearest approach to it was on the 16th. In May 1841, we had no approach even to frost. In May 1840, there was no frost either, but the nearest approach to it was on the 19th. And in May 1839, we had frost

\* Vol. iii. p. 1.

† Vol. i. p. 322.

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on the 15th. Now, though in these six years there were three, when we had no frost in May, happily, yet experience shows us that there is a chance (and a very great one) that there will be a frost in that month, and that if it does occur, it occurs between the 14th and 21st of the month; and that, having got over that period, (with or without the frost) we need not fear its arrival after that date. Thus then we have but to wait patiently for the last week in May, ere we venture to put out our half-hardy plants, unless we have at hand the means of protecting them at nights.

This synchronism of the spring frost is not at all more remarkable than that of the frost which deprives us of our *Dahlia* blooms in the autumn. The year 1839 was the first year of my gardening experience; and I find that *Dahlias* have been destroyed by the frost in that and the following years on what may be called almost the same day, viz., in

1839, October 6th—1840, October 3rd—1841, October 3rd—1842, October 4th.

In 1843, they were destroyed on the 29th September, being *four* days earlier than usual. This reminds me of a circumstance which aids very much my opinion as to locality being of greater importance than latitude, with respect to *Dahlias*. In the years 1839, 1840, and 1841, my *Dahlias* were planted in the higher part of my garden where they were sheltered by trees and shrubs, and in those years, while my neighbours, whose gardens are lower than mine, lost their *Dahlias* on the days just mentioned, I still had the pleasure of seeing mine unscathed, and enjoyed their blooms (in 1839) until the end of November. In the years subsequent to 1841, I planted them in the lower part of my garden, and have lost them on the same day as my neighbours lost theirs.

The synchronism of fruit blossom is also well worthy the attention of gardeners. I find that the blossom of the Cherry tree is particularly punctual in its appearance. Thus, I observed it on the 3rd of April, 1840, on the 5th April 1842, on the 4th April 1843, and on the 5th of April 1844. In 1841, it was earlier in its appearance; for in that year I find its appearance recorded on the 22nd of March.

The last tedious winter which it will be remembered, was prolonged to the end of March, completely threw me off my guard with respect to the synchronism of flower blossoms, and I was among the most despondent as to the appearance of spring flowers, but I received a hint, not to be hasty in condemning any season as peculiarly bad which will long be remembered. On the 27th of March, I was making some no very complimentary remarks on the season, and amongst other causes of complaint, I said that in 1843, on that day I

had Van Thol Tulips in flower in the garden—but this year—when might I expect them? On the following day I found two in bloom!

I have no doubt that if this subject of "synchronism in temperature and in bloom," could be carried out by your correspondents, and each one was to become an observer of facts, a great deal of experience might be gained. For, though lest I should trespass too much on your valuable space, I must now close this letter, I think I could have afforded you some other examples of synchronism both in temperature and in the time of blooming. And surely there must be some others of your readers, who have given their attention to these matters. The value and importance of such experience is self evident; and it is only from a wish that others should make known their experience in these matters, that I have been induced to give these few facts. Though they may appear too trivial to arrest the attention of some at present, I am persuaded that were more such facts accumulated, and a comparison made of one circumstance with another, much useful knowledge might be obtained. And who knows, but that eventually we might, by a comparison of notes and observations, attain to a much more certain mode of guessing at the contingencies of the weather than by perusing the nonsense of a weather almanac.

JOSEPH ATKINSON.

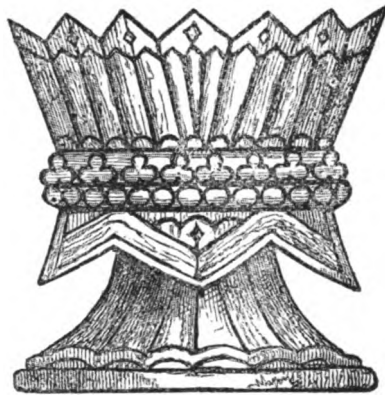
*Harraby, Carlisle, 15th June, 1844.*

#### ON THE STRAWBERRY.

If any person adopt the following rules they will never have an unfruitful plant in their beds. It has always been a custom to dig the ground very deep for Strawberries, as it is said they delight in deep rich moist soils; I admit they grow more luxuriant in deep rich moist soil, but luxuriance is not always to be desired in cultivating fruit (neither should a cold or wet situation be chosen), for we invariably find our fruits to be much better flavoured in warm soils than any other. But, to go farther, it was written more than a hundred years ago, that "the mountainous Strawberries of warmer and drier countries, though they grow among bushes, yet enjoying more sun and a *drier soil*, are much higher flavoured and larger than ours." Here, then, we find strawberries growing on a mountain are better flavoured than ours, and, the flavour being the first consideration, we might reasonably conclude that cold moist soils are not congenial to their well-being. Soil proper for Strawberries should not be cold or moist, or over rich with manure, but rather retentive than otherwise; warm light soils made retentive by pressure will be found to produce the finest flavoured

and largest fruit. If the soil is very cold and adhesive, take a sufficient quantity of brick-bats and old mortar, lay it in any by-road until it is powdered to atoms, and in any of the winter months lay it three inches thick over the ground you intend to plant with Strawberries: choose a dry day in March, turn it over thoroughly, incorporating every particle with your natural soil, and never dig more than a good spade depth. If your soil is naturally dry and light, add a third of tolerable stiff loam from an old bank, and a light coat of manure (rotten leaves); prepare it as above, and, as soon as you have well dug the ground, set to and tread it down as firm as you reasonably can. Keep it free of weeds till May; about the middle of the month just crack the surface with a fork, take

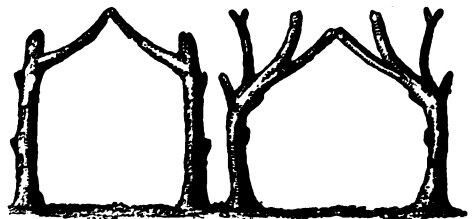
the runners of *last year* that have never been removed from the parent plant, choose such as have blossom buds on them, and, above all, be careful not to plant too deep. The plants should stand at least a foot apart, whether in rows or in beds. In autumn cut off all runners, dress the bed with good manure, and let it lay till the following March, then cut off all old leaves, and rake the beds nearly off as soon as your strawberries begin to put up for bloom; give a good watering, lay over the surface a coat of clean straw, plug it down with sticks, and the season must be very dry if they require any more water. Renew your beds every third year. I have practised the above method for twelve successive years, and find it is my own fault if I ever have an unfruitful plant.—W. PRESTON, Andover.



### RUSTIC WORK.

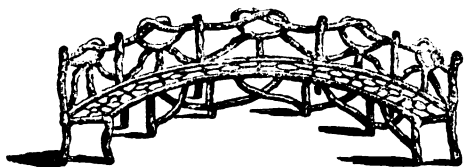
THE illustration of this interesting, because easily managed, portion of ornamental garden building, is a prolific source of fanciful embellishments, whether we allude to the endless designs for basket-work, the numerous modes of getting up garden seats, or the merely giving a rustic feature to buildings already existing, by the addition of oddly-formed branches of trees. After giving so clear an insight into the easy method of securing uniformity by splitting a branch in two, there remains but little to say upon the subject, and especially as every different application of the feature may be a different fancy, and be fettered by no rule. We have seen a bundle of wooden hoops, which are, in fact, clean, long, supple sticks, split with their bark on, cut into lengths, to cover the front of a summer-house, which showed nothing but the bark of these split sticks, which were close enough side by side to cover any thing. The same thing can be done with anything that is wood; and we having a shabby-looking deal table

adapted to a rustic summer-house, by covering the entire surface with these same kind of hoops, which are bought in lengths, not turned into the hoop form, and are the very best description of stuff for small work, because they run so even. The rustic flower-box is formed something after the fashion we allude to. The seat is more dependant on itself,—as indeed seats should be, for the stuff should always, for



the sake of appearance, be as large as it ought on account of strength. The great thing to remember in the construction of rustic work, is, that however singular the form of a branch

may be, so that it is flat one way, it can by splitting be made to form a perfect duplicate, by splitting it down the middle, but the bends and branches must be only one way, or rather only two ways. It may, as it lays on the ground flat, bend right and left, like a snake, and have twenty branches right and left, and it will split into two uniform pieces, but if it be bent up or down at the same time, it could not be used in duplicate.



THE TULIP.

To say that the Tulip is the first in rank among florists' flowers, is only to repeat that which has been better said by fifty before us; but we say it is impossible for any gardener to produce an assemblage of plants or flowers so arranged as to vie with a bed of Tulips. Nor does the conservatory offer a more ample scope for taste in its erection, or display in its contents, than does the light summer structure to preserve an assemblage of the "queen of flowers." We have visited many of the best arranged gardens near the metropolis, in some of which there has been much to admire, and in most of which there have been large collections of plants, but there yet required the Tulip-bed; for hundreds who admire beyond description such an object in the grounds of other persons, nevertheless delay the addition of it to their own gardens: and however they may individually reject a flower without perfume, they have only to recollect the pleasure they have derived from the inspection of a complete bed, to estimate properly the addition to their own grounds. His Grace the Duke of Devonshire, was, perhaps, the first nobleman who attempted to grow a collection of these beautiful flowers. The collection originally presented to Queen Adelaide by the Metropolitan Society of Florists were considered by the authorities as a present to the Crown rather than to the individual, and they are, we are told, still an appendage to the Castle-garden at Windsor. We should like to see the example followed by persons acknowledged to be spirited cultivators of plants, and patrons of horticulture; and especially those whose ample means would enable them to exhibit considerable taste in the erection of the awnings or buildings intended to protect them. But if any body can be induced to grow a bed of Tulips as they should be grown, the person

who has a valuable collection of Botanybay and hardwooded greenhouse plants, should be above all tempted, if it be only by the splendid protection the Tulip erection forms for those plants during the summer growth. If well contrived, the degree of shade, of air, and of moisture, allotted to the plants, can be regulated instantly and constantly, with scarcely any trouble; and those who have seen the manner in which such plants have flourished in even an inferior description of building under which the Tulips are grown, will at once appreciate the advantage of it. But to return to the Tulips themselves; many people, we are convinced, delay season after season growing a bed of Tulips, only from a notion they are troublesome, or that there is some difficulty in procuring a fine collection without paying an exorbitant price for it. These are erroneous notions; Messrs. Lawrence of Hampton; Brown, of Slough; or Mr. Groom, of Clapham, the most extensive growers and dealers in or near the metropolis, would undertake, for a moderate sum, to plant a bed of fifty or a hundred rows, arranged with strong blooming roots, such as would satisfy any lover of the flower at the flowering time; and this, once done, the possessor has only to visit other beds, and select here and there a favourite to add to his collection. These additions may be judiciously made without altering the size of the bed, because one would be removed and another put in its place without changing the arrangement. As deaths and changes occasionally throw collections at liberty, an advertisement for a bed of Tulips would probably produce one still cheaper; but, as a beginning, we prefer going to a dealer who can be depended on for the varieties, and who will replace any deficiencies that may occur. We engage, that any person who has not grown a bed of Tulips before, will be delighted with the novelty; and if the awning be tastefully erected, and well planned, it will form a pretty object in the grounds. Time was when the Dutch people headed us in the culture of the Tulip; but since the English growers undertook its cultivation in earnest, we have left the Dutch far behind. The most beautiful varieties are of English origin; strange as it may seem, those of home production are rapidly superseding the Dutch varieties, which, with some exceptions that will always remain exceptions, the English beat in every property. By authorising a dealer to make up and plant a bed, all trouble and responsibility of choice devolves upon him; his credit is at stake for its beauty and completeness. We wish the Duke of Devonshire's bed of Tulips had been better, it was very inferior and deficient of many of the best

flowers, quite enough to disgust him. Our readers need not be alarmed at the probable price of a bed of Tulips; a dealer will, for the chance of future favours, put in a score roots, which, by the catalogue price, would amount to more than he will charge for the bed of three or four hundred; and Tulips, unlike many other valuable plants, propagate themselves without any trouble to the grower. These circumstances combined, induce us to hope that many wealthy patrons of horticulture will add to their gardens a bed of Tulips, the expense of which they may ascertain by the exchange of a post letter; but the value of which, as an ornament and a source of gratification, they have yet to learn.

#### THE PEACH TREE, ITS DISEASES AND REMEDIES.

THE Peach tree on the open walls, require close attention, to prevent injuries from insects, from diseases in the foliage, in the stems, and a variety of other evils which might be enumerated. The thinning of the fruit is fraught with consequences of a far more disastrous nature, than is usually supposed. The season and time when this operation should commence can be best determined by the size of the fruit. The first thinning should take place when the fruit is about the size of peas, and should be performed with care; a small but blunt pointed pair of scissors is often used with advantage, or the finger and thumb, with a small pointed stick, is very well adapted for removing them. At this thinning a few only should be taken. The second thinning should be performed when the fruit is about the size of small gooseberries. If this second thinning could be dispensed with, it would be of great advantage to the trees; but from such causes as overcropping the preceding year, and the multiplied causes which affect the health of the trees, many of the fruit fall off during the season of stoning, so that experience has proved the necessity of leaving a few to be removed at this season. The quantity of fruit that each tree should bear ought to be determined by the state of the tree itself. Sickly and young trees should be allowed to bear fewer fruit than the healthy and well-established plants; and in either case, those varieties which produce large fruit should not be allowed to mature so great a number as those which bear small fruit. Over luxuriant trees should be allowed to bear what is termed a heavy crop; this will moderate their luxuriance, and prove beneficial to the tree itself.

With regard to insects, many are the absurd and ridiculous compositions and plasters which have been recommended by authors, to

cure and prevent the prevalent diseases of peach and nectarine trees. More ignorance, and quackery prevails on this subject, than is connected with any other branch of gardening. To destroy the green and black aphid, a powerful fumigation of tobacco leaves is generally effectual. When the trees are in peach-houses, under glass, the garden engine should be applied to throw water on the roof, in order to close up the tops of the glass; and the operation should be performed at night, and the house kept closely shut up till the following morning. When the trees are on walls in the open air, they require to be covered with canvas or tarpauling, and treated in other respects as those under glass. Both require to be well syringed with clear water the following morning. Instead of fumigating with tobacco, the trees are sometimes syringed in the evening, and immediately dusted with Scotch or other cheap and pungent snuffs. The moisture on the foliage causes the snuff to adhere, and also dissolves it, producing a liquid which is speedily destructive to the insects.

The red spider makes its appearance in dry and warm weather on trees in the open air, and in Peach-houses when too much heat is kept up without sufficient moisture; it therefore follows, that an abundant application of the latter is the only remedy; and it must be applied freely. Peach trees require much attention, to guard them against the attacks of this insidious and most destructive enemy: for it too often happens that it has taken such possession of the trees, as to defy any application to remove it, until it has destroyed the foliage, by rendering it unfit for its ordinary functions.

The scale or coccus is less understood in their natural economy, and, therefore, more difficult and uncertain in their removal. Perhaps the surest, as well as the most simple and effectual methods of destroying them, is by washing them off while the trees are destitute of foliage: this should be done in the spring.

The diseases of Peaches and nectarine trees are various, and not easily accounted for; they are in most cases the result of improper food taken up by the roots, or imbibed by the foliage from the surrounding atmosphere; the sudden transitions of heat, cold, drought, and moisture, are often productive of silent but fatal consequences to the leaves and tender shoots of the Peach and Nectarine. There are also diseases arising from accidental or wanton injuries, being the effect of injudicious pruning, that is, at improper seasons, the removal of large branches, making ragged wounds in cuttings with a blunt knife, and frequently from the bark being bruised or torn off; the latter of these evils is within the power of the culti-

vator to prevent, and the former may be remedied by substituting suitable for unsuitable soil. Borders which were once good and proper may, nevertheless, be exhausted, and from age require renewal.

Mildew, gum, canker, and honey-dew, are effects resulting from some of the preceding causes, and must be treated accord-

ingly. Mildew is the most prevalent of these evils, but is also the most easily contended with. Dusting the foliage and young shoots with sulphur when the trees are damp, and allowing it to remain on; it will gradually ignite by the heat of the sun, and burn off this minute fungus without injuring the foliage. M.

## GLENNY'S GARDEN PRACTICE.

### KITCHEN GARDEN—JULY.

**BEANS.**—Sow the last Kidney and Broad Beans from which there is any hope of a crop: top those of the broad kind which are coming into bloom, draw up the earth about their stems, and constantly cleanse them from weeds.

**PEAS.**—Continue to sow your small seasons of Peas twice more this month, they will most likely both tell well; earth up others as they come forward and stick them.

**SALADING.**—Sow Lettuce, Endive, and, if you consume any, small salading also, plant out Lettuce that is ready, and thin out any that are to stand and cabbage where they have been sown; plant out Endive on well dunged ground, water well the first week.

**BROCCOLI.**—Plant out for a full season whenever a good fall of rain shall have put the ground in proper order, for if you plant out in dry weather you incur immense labour in watering before the plants can lay hold and grow. If you must plant out some, give the ground a good soaking before you commence, and if you do it all over two days following, it will be all the better; nevertheless, it is better to wait for rain if possible: sow the last seed the first or second week.

**CABBAGES and SAVOYS.**—Transplant some of each, and attend especially to the directions about rain; sow seed of Cabbage for Coleworts to draw in winter and stand for spring when other greens are scarce. If you have cleared off a piece of Cabbages plant the stumps close together in any spare corner for sprouts.

**CAULIFLOWERS.**—Plant out from the May sowing, attending to the instructions about rain, or doing that which shall make up for the want of it. Break down the leaves of those which are showing the flower to protect them from the sun, which would injure the colour and texture of the head.

**ONIONS.**—Sow some to stand the winter about the end of the month, but not too many as next month will be more safe for a larger quantity. As soon as they are well up thin them and weed them; bend down the leaves of any that are nearly full grown, and take up any that are ripe.

**CARROTS.**—Sow some for use in the autumn and winter, taking care that the ground is well dug and pulverized a considerable depth; let the situation be open, and as soon as they are pretty strong hoe them to get rid of the weeds and regulate their distance from each other.

**CELLERY.**—Transplant the principal quantity you rely upon for winter use, let the situation be open, the ground well dressed, and the trenches a foot deep, and if the ground be not good at the bottom, take a spit out all the length and put in better. If you have, according to our notions of providing for a family, already planted rows at different seasons, you will not be anxious for so large a quantity at a time, but rather make two plantings in the month upon the plan you have already gone, merely doing a row or two at a time, continue to earth up that which is advancing, choosing dry weather for the operation, beating the earth small as you go on, that it may close well about the stems.

**TURNIPS** may be sown at twice, but if there be no rain to get the ground in good order, soak it well the day before, and if there be no rain for a day or two when sown, give water until it is up, and every morning before sun-rise after it is up, until it has the rough leaf, or the rain has superseded the necessity of your troubling yourself. Hoe the Turnips now up, and regulate their distances.

**RADDISHES** may be continued according to the supply required, frequent sowing can alone insure them in good order. The turnip rooted is the best for use, though short topped may also be sown.

**SHALLOTS and GARLICK** must be taken up, dried, and stored as soon as the leaves begin to decay.

**CUCUMBERS.**—Give plenty of air to those in frames, and plenty of water to those which have been placed out of doors and under hand glasses, as well as those planted in the open ground for pickling.

**WINTER SPINACH.**—Sow in an open situation the last week, and you may get in if it is likely to be required a crop of the round



leaved at the beginning, but this is to use very young, as it soon runs to seed.

**ARTICHOKES.**—The side shoots produce fruit which must be picked off if you wish the principal one to be large and fine; they are ready to cut as soon as the scales begin to get a little open, and before the centre opens to show the flower; as soon as you cut the first, cut off the main stem pretty near the ground to encourage suckers.

**LEEKS.**—Transplant six inches apart in rows, and twelve from row to row.

Gather seeds as they ripen, and herbs before they bloom or get old; plant slips of sage, mint, and other herbs if you have not already done it, taking the side shoots in preference; dig up vacant spaces, and dress where it is necessary, ready for crops; weed all crops, and constantly keep down vermin by any or all the means you know of.

#### FRUIT GARDEN.

**WALL FRUIT TREES** require the young shoots that are wanted to be tacked as they lengthen, to prevent their being blown about by the wind, and the useless ones to be taken away. If the trees are under control, train and nail them all in their proper places, but if they are old and not yet under control, tack them any where until the autumn, and then regulate them as well as the obstinacy of the old branches will allow; thin the fruit for the last time leaving only the quantity you wish to ripen.

**VINES** require to be looked to lest any fresh shoots may have come where they are not wanted, for it is the very life of a Vine to take away all but the shoots intended to bear next year, and to keep these few and far between.

**VERMIN.**—Now is the gardener's troubles commencing in good earnest, and often will he find the snails, if harboured on his neighbour's side of the wall, take their evening walks among what they perhaps consider better food; I had once a next door neighbour fond of ivy, and a whole regiment of snails used to bivouac among my peaches, nectarines, and apricots, in preference to remaining on their own side, I tried many ways of cutting off their communication, and at last beat them by putting a ridge of lime along the top of the wall, but I had to renew it often, for when it had been wetted and dried again, they passed with impunity. It is impossible to be too vigilant in catching these, wasps, and all other vermin, wide mouthed bottles of sugar and beer are very useful.

**MELONS**, give air and be sparing of water. Let them have all the sun.

**BUDDING FRUIT TREES** is an operation which enables us to change the sorts on a wall or to raise young trees, and should be done early

this month. Plum stocks will do for nearly all stone fruit. Cherries are better on Cherry stocks, when you have tied on the buds, a handful of moss damped may be tied loosely for a time, and it may be occasionally watered.

**STRAWBERRIES** require water in dry weather, some plant new beds this month, I do not.

#### FLOWER GARDEN.

**BORDERS** and beds may be planted with Geraniums, Balsams, Petunias, Verbenas, Fuchsias, tender annuals of several kinds, or any other turned out plants, wherever bulbs have been taken up, or subjects that have done blooming have been removed.

**CARNATIONS** must be constantly watered. The surface of the compost in the pots occasionally stirred, the stems as they rise must be tied to the proper stakes. The buds must be reduced to three at the most, if you intend growing them for exhibition. As the buds swell full of petals, they must be tied carefully round about half way up, and the calyx opened in its five divisions from the top down to the tie as soon as the colour shows; as the petals show themselves, lay down the large ones six in number so as to form as good a circle as possible. The next sized petals should as they grow, be brought down each to cover the places where the larger ones meet. This done the smaller ones which are perfect, should form a third row covering the places where the second ones meet, and if this be carefully done while the petals are growing, they will remain steadily in their places, and the flower will be much more brilliant and beautiful than if they were allowed to bloom their own way and be dressed afterwards, which is a common practice. Many persons water them with liquid manure, but I have seen and grown the finest specimens both in size and colour with only soft river or rain water, and until I see something better than I have yet seen as the result of liquid manures, I shall keep on as I have hitherto done. If the soil be rich enough at starting, there will be abundant nourishment with only rain or river water, and where the air is good, nothing will be wanted to improve the colours.

**TULIPS** and all other spring flowering bulbs ought to be up and in their cases; this suggests that when it has been neglected, there should be no time lost in doing it.

**GERANIUMS.**—Look over seedlings, and if there be any whose petals are thick, flowers round and smooth on the edge, colours bright or novel and well defined, trusses close and large, and the habit of the plant good, save them, but all such as have the upper petals inclined to be high or pointed, under petal longer than the side ones, or any of the petals loose or irregular, or thin, throw them away,

or make them market plants, for they cannot be good as show flowers. Let those of the collection which have done blooming be cut back, and the cuttings be struck; they will do in the open ground under a common hand-glass.

**PINKS.**—Propagate by pipings, you take from the bottom of the plants the shoots, of which you use only the top and second joint, make the place on which you strike them very soft with water almost like thick mud, strip off their under leaves and insert them close together, put over them a common hand-glass and shade them from the great heat of the sun; most people cut the leaves off square, almost close down to the heart of the shoot, see afterwards that they never want for water.

**AURICULAS.**—Take off dead leaves and offsets, that the latter may be struck if they have no root already, or be separately potted if they have. Prick out seedlings if they are ready, and keep any seed pans or pots moist if you have any coming up or not come up; those which have been pricked out must be carefully tended with regard to water and keeping off the hot sun.

**POLYANTHUSES** may be still parted and planted out, and seedlings may be planted out six inches apart.

**GREENHOUSE PLANTS** require the same management as in June. Seeds that have ripened may be sown at once. Look well to watering.

**DAHLIAS** may be still planted out for late shows. As they grow, merely take off branches that are in each other's way, be not persuaded to fall into the common error of cutting almost a whole plant away that the skeleton may bring larger flowers. The Dahlia acquires strength from its leaves and branches, and requires only to be pruned enough to let in light and air: when a flower offers itself to your notice as likely to show well, take off all other buds on the same shoot, and pinch off the end of the shoot that is beyond the stem, because that is sure to divert the strength of the plant. Take care also to cut off every bloom the instant its beauty is gone, because the swelling of the pods of seed weakens the plant more than blooming the flower does. Dahlias may be either watered with liquid manure, or mulched, but even these do wonderfully well in good strong ground with only judicious watering with soft water. If mulched, the fibres will all come to the surface, and therefore, if the dung or litter be allowed once to get dry, the plants will receive a check which they will not readily get over.

**ROSES.**—If not done last month, must be budded without delay. It may be more difficult because the bark may not rise from the stock so well, and the wood inside the bud cut

off will not leave perhaps without dragging out the bud with it; and if there appears on drawing out the wood, a small hole in the inner part of the bark, and a small point on the wood so drawn out, it may be inferred that the germ has been taken from the bud. If so, it is better that the proceeding with the bud go on without taking out the small portion of wood that comes off with it. The bud will not lay quite so well on the inner wood of the stock, because when you cut off the bud, the inside is flat, and the wood of the stock when the bark is raised is rounding. All you can do is to cut off a thinner piece with the bud on it, and then the union will be better promoted; when the bud is fitted and tied in, a handful of moss must be at first loosely tied on it, to be damped and occasionally wetted to keep off the wind and sun for a few days while the union is secured.

**AUTUMNAL FLOWERS.**—Plant the *Amaryllis lutea*, the Autumnal Crocus, and any other autumnal bulbs which will make a show in the late months of the year. They may be planted in patches or beds, or clumps as required. The Autumnal Crocus is purple, the *Amaryllis* is yellow, and they make a pretty mixture when few other flowers are in order.

**MIGNIONETTE** and Stocks may be sown to flower in pots in the winter months.

**CUTTINGS OF GREENHOUSE PLANTS** of almost any kind may be struck.

**CAMELLIAS** may be inarched or grafted as soon as they have made their growth and ripened; cuttings from single and strong growing sorts may be struck for stocks.

**RHODODENDRON.**—Cut off carefully all the flowers of *Rhododendron*, for if the seed pods be allowed to swell, it is a great chance if the plant can perfect bloom-buds for the next year. It is this which in most cases prevents American plants from flowering well two years running in many situations; where you design to save seed, save from the best individual flowers only, as well as plants, and prevent all others from perfecting seed; better have a small quantity good than a large one only middling.

**CLIP BOX EDGING**, weed and water, cut hedges, mow lawns, gather seeds that are ripening and preserve them, tie up tall or straggling flowers and plants, cut off all decaying blooms from every thing that is required to keep in flower unless the seed is wanted, for the seeding distresses a plant.

Tie up or nail all flowering climbers, especially roses, and allow no pods of seed to swell. Look carefully through the previous directions, and do any thing that is left undone, even to the sowing of seeds of perennials and biennials, and short lived annuals.



## THE GARDENER'S SKETCH BOOK.—NO. III.

ANOTHER of the sketches from our humble friend's book, shows that it is quite possible to select particular scenes and make them understood, without being a good draughtsman; and as the study of effect is one of the chief attributes of a good landscape gardener, the series will hardly fail to be useful. It might have added to the interest of these sketches to have given the "whereabouts" of each, but in all probability there is hardly a vestige left, for many a lovely bit of landscape has fallen a sacrifice to rail-roads and house-building. We recollect an instance of one beautiful bit of effect being destroyed by the pulling down of a mansion; nothing but the portico could be seen through the trees. The impression this little bit of the Ionic order made was strong, and the demolition was greatly regretted: for years the four pillars and the fascia lay at an old building-material yard, where it was by chance recognized, bought, and used as the front of a summer-house, so placed as to give the exact effect it produced in its original position, and where it has been admired for the last few years by every body that passes. Such is the use of first impressions; and when they can be engrafted on the mind by a sketch, they are yet more useful.

## THE CULTIVATION OF THE TEA-TREE IN EUROPE.

IN a late number of the *Journal d'Agriculture Pratique*, we find a translation of an article in the *Quarterly Review* on the culture of the Tea-tree in China—the translator, who we have reason to believe is M. Poiteau, a gentleman well known and justly looked up to in France for his attainments as an agriculturist and horticulturist, makes the following remarks on the article:—I will make two observations on this statement. The first, that the cultivation of the Tea-tree and the preparation of the leaf are touched on so concisely, that we find nothing with which we are not already acquainted. The second, that we find it there laid down that any exposure to the east wind is mortal to the tree. If this assertion is rigorously true, which I do not believe, it would result, that any attempt to introduce the plant into our Mediterranean departments would be utterly useless, for the east wind makes itself felt more constantly there than in any other part of France.

For more than forty years two kinds of Tea

have been cultivated in the Orangeries of Paris; and in those different points in the kingdom where collections of foreign plants have been made, and everywhere it has been found an easy matter to multiply the plant by slips. These endure four degrees of frost without injury, and in this respect their sensibility is equal to that of the Camellia and the Orange-tree. These slips bear flowers in abundance each year at the end of winter: their colour is white, about an inch in size; but up to the present period they have not produced fruit. When it was ascertained that the Tea-plant could support the same degree of temperature as the Camellia and the Orange-tree, the government of Louis XVI. caused some plants to be transported into Corsica, in the hope that, if they should bear the climate, they might multiply and become an important object of commerce.—This attempt was twice made, but was unsuccessful, on account of the disinclination of the inhabitants of the island to attend to it. About the same time the government had some

plants sent to Charleston, in Carolina, where France possessed a botanical garden; but the attempt also failed, for the Americans took as little care of the gift as the Corsicans, so that the plants soon perished. At the same period the Portuguese government introduced the Tea-plant into the Brazils, in the province of Rio Janeiro, about the 25th degree of southern latitude. Since then it has always been preserved there; but the cultivation makes no advance, because the Tea-leaf of this country is not received by the trade. However, in every town in Brazil the plant is preserved, as a matter of curiosity, in the botanical gardens. In 1818, I received, from Cayenne, about half-a-dozen plants grown at Lara (a town under the equator), which were of very feeble vegetation, and which had been in a languishing condition at Cayenne, arising, in my opinion, from the excessive heat of the country.

At present, when it is almost certain that the Algerine territory is to remain in possession of France, our agricultural writers recommend the cultivation of the plant in that colony. Their intentions are undoubtedly laudable; but, before any great expense is entered on, it will be well to ascertain if the Tea-plant will grow there properly; next, if it will possess the same qualities as that coming from India; and, lastly, if we shall be able to prepare the leaves as well as the Chinese. It is rare that plants do not lose some of their properties in passing from their native soil to a foreign one. The clove-tree and the pepper-tree, transplanted at Cayenne, produce cloves and pepper which is nearly, if not quite, equal to the same spices raised in India. Whilst the cinnamon and nutmeg-tree, carried from the Moluccas into Guiana, produce in this latter country nutmegs and cinnamon which scarcely possess half the qualities which are found in the same spices coming direct from India.

The question of the probability of the Tea-tree being naturalized in this country has been more than once discussed in works of horticulture. The Abbe Voisin, the head of the French establishment for furnishing foreign missionaries, once addressed a note on this subject, which we think may prove interesting to the English reader. He wishes to resolve two questions—one respecting the growth of the Tea-plant in the cold regions of China; and the other respecting the chances of its flourishing in France. With respect to the first point, he declares that he thinks it best to describe what he himself beheld; and, touching the second, he allows horticulturists to form their own judgment on the matter.

"In the year 1833," he proceeds, "I made an excursion into Mon-p'in, a small principality situated in the country of Si-Fan (Thi-

bet), to the west of the province of Sse-Tchouen, through Tchling-T'on, which is the capital. This town lies in 30 deg. 40 min. lat., and 12 deg. 18 min. long., reckoning from the meridian of Pekin. On the mountains which I passed over in proceeding to Mon-p'in, I was quite surprised to see fine black-tea trees. The period of the year was the beginning of May, and in the plain the inhabitants were taking in the barley, wheat, &c. The mountains were not at the time yet free from snow, and during the nights of the 4th and 5th it fell in great abundance. I can bear witness that on these elevations the cold is far more intense than at Paris, even during the severest winters. I will add what happened to one of our brother missionaries, who was so incommoded by the heat of the plains, that a change of place was absolutely requisite, and he repaired to Mon-p'in to perfect himself in the Chinese language. During the short time that he sojourned there the cold was so intense, that he twice fainted whilst saying mass; so that he was eventually obliged to quit this country of coolness, for which he had so longed, in order to seek a warmer climate.

"The winter of 1822-3 was so severe, even in the plain where I then happened to be stopping, that the ice on the ponds was of three or four inches thickness. In the district of Kliong-Tcheon, distant between twenty and thirty miles from the capital mentioned above, where tea of every description and quality is gathered in abundance, the cold was still more intense, and still I never heard that the slightest uneasiness was felt respecting the effect of the frost on the plants. I passed through the whole of the province of Fo-Kien, as well as that of Tele-Kiang (one situated in 25 to 27 deg. of latitude, and the other 27 to 30 deg.) These provinces are noted for the excellence of their teas; and yet here the cold is so intense, that often on the public roads persons are found lifeless from the frost.

"In a short time the government (of France) will, it is said, collect together seeds of every sort of tea, through the care of M. Louis Hebert, whom the minister of commerce has sent on a mission to China to procure the best description of mulberry-trees and silk-worms. If, as I firmly believe, the efforts which are now making to introduce the tea-plant into this country shall succeed, we shall speedily have to congratulate ourselves on a new branch of industry, the advantages of which are as yet incalculable.

"There exists in China a complete history of the tea-plant, which comprehends four-and-twenty treatises on the subject, composed since the seventh century. M. Stanislas Julien, the learned professor of Oriental languages, to

whom we already owe the translation of the Chinese treatise on the treatment of silk-worms, and the cultivation of the mulberry-tree, is engaged to render into French this work on tea. In it every information necessary for the proper cultivation of the plant, and its different preparations, will be found fully set down."

If this statement be correct, and there is no reason to doubt it, the cultivation of the tea-plant on a large scale might be found to succeed in England. Experiments have been made, as we understand, near Birmingham on this subject. Perhaps some of our correspondents in that quarter could give us some information respecting them.

#### THE FORCING OF CUCUMBERS.

As the Cucumber has been known in England from the earliest records of horticulture, he considered it was only necessary to observe that it was a native of the East Indies, to guide us in our forcing operations, and then proceeded to a detail of his practice when he had not the advantage of a pit:—I prepared and made a seed bed for a one-light frame in the usual manner, with stable dung, and sowed the seed on the 22nd of October, paying due attention to the potting off the plants, putting three in each pot, watering and keeping the temperature in the frame from 70 deg. to 75 deg., so that I was enabled to give air more or less every day, which is most essential to the health of the plants, always taking the precaution in frosty or windy weather to hang a small strip of mat over the end of the light, that the air might sift through it; the mat should not hang so low as to touch the lining of the bed, by which steam would be introduced instead of that within escaping.

Having thus prepared the seed-bed, I now proceed to describe the formation of the fruiting bed. I procured four posts, and fixed them firmly in the ground to place the frame thereon, allowing the back posts to be about six inches higher than the front. I then placed two old hotbed lights in the centre of the bed north and south, the upper part of one light leaning against the upper part of the other, and separated some distance at the bottom to form a chamber in the bed for the purpose of filling it with hot dung to keep up the bottom heat when the linings declined; the supply when necessary can be given by opening small holes in the linings opposite the ends of the chamber. The space between the chamber and the frame was filled up with billet-wood firmly packed together to prevent the soil in the bed from sinking, which frequently takes place in the old method of dung

beds, to the injury of the young roots. In piling the billet-wood, due precaution must be taken not to allow any of the ends to project beyond the perpendicular of the frame for in that case it would prevent the linings from setting regularly, and cause them to fall from the sides of the bed, by which a vacuum would be made for the escape of heat; when the wood is piled to the frame a little litter should be thrown over it, and all carefully turved to prevent the rank steam which ascends through the vacancies between the billets from getting into the bed. The frame used was two feet and a half high in the back, and fifteen inches in the front, the depth of soil about fourteen inches. I spread a small quantity of well rotted dung and leafmould equally over the top of the turves; the hillocks for the plants were placed in the centre of each light; the soil was the top spit taken from an old orchard where sheep had been penned, it was collected in the summer, repeatedly turned over, and mixed with a portion of well rotted hotbed dung and vegetable mould. I generally planted out the first week in December, cut a brace of Cucumbers, twenty-four inches long, fit for table the last week in January, three or four the first week in February, and had a regular weekly supply until my second bed came into bearing, which I made about the third week in February. The sort I generally grew was a long smooth green Cucumber, from eighteen to twenty-four inches long. It was called Francis's, after Mr. Francis, gardener at Mostyn Hall, who generally succeeded in gaining prizes with the same sort at the different shows around Liverpool and Manchester.

Before fixing the frame upon the posts, I nailed a ledge of wood to the bottom of the frame projecting inwards about four inches, and then nailed another board upon that in a perpendicular direction, so as to form a sort of double frame with a space of three inches between the board and the frame, to prevent the roots from being burned, and to allow the hottest and rankest dung to be applied without injury.

In watering I was careful in having it of the same temperature as the soil; and in putting down the lights for that purpose, I always had a mat thrown over me to prevent too much cold air being admitted to chill the plants. Having other lights that fitted the frame, I was enabled to keep the glass clean by washing and removing them alternately every week. The temperature of the frame I was able to keep in the coldest weather from 68 to 75 degrees, and could admit air more or less every day, which is most essential to the health of the plant. He recommended thatched hurdles to be placed against the linings from the top to the bottom,

to prevent the heat from passing off so rapidly as it otherwise would do.—*Mr. Cooper at the West London Society.*

#### ELTON STRAWBERRY.

EVERYTHING connected with horticulture, by which the name of the departed president, Mr. Knight, may be commemorated, ought to be treasured up—he rests from his labours, therefore let his works follow him. The superb fruit of which we propose to say a few words originated we believe with him—for Knight's Elton Seedling was the title with which we received our specimens. The beauty of the fruit we cannot pretend to describe; and, therefore, refer to George Lindley's Guide to the Orchard and Garden as our authority; premising that it is late, perhaps the latest of the varieties, the flavour, till ripe, is too acid; therefore, to do it justice, it ought not to be touched till the berry attain its most *profound* tint of crimson, or rather intense red. The size is large, the figure between that of the finest cockscombed *keen*, and the *old pine*; the flesh extremely firm and buttery: a well-grown large Elton is, in plain, homely terms, "a good mouthful." We wish our readers the enjoyment of the innocent luxury by thousands; and can promise them that, such is the prolificity of the plant in making runners, if the soil be congenial, and the mode of cultivation judicious, they may be speedily gratified to their heart's content.

"No. 18 of Class III.—*Caroline or Pine Strawberries — Elton Seedling* — (Pom. Mag. 135.)—Fruit large, ovate, often compressed, or cockscomb-shaped—of a rich, shining, dark red. Seeds yellow, regularly embedded between ridged intervals. Flesh firm, with a small core, deep red, juicy, and having a sharp rich flavour."

This description, short as it appears, is very comprehensive. We, said Mr. Towers, once received about twenty-five plants in October, 1835, runners of the summer: they were planted in a strongish manured loam, wherein asparagus had grown. A single row was made, and this, of course, remained silent during the winter, and the spring of 1836; but when growth commenced, it went on rapidly, and runners were produced in abundance, which filled the original plot, and bore a fine crop of fruit. In 1837 the bed became a mat of runners, from which two rows, ten yards long, were formed September 15th. At that season of the autumn (for summer it can hardly be considered) the roots are strong, and enough of exciting stimulus remains to fix them in the soil. We cannot approve of July planting; nine-tenths of the thin, weakly runners perish by drought, but in the latter end of August, or

early in September, present success is almost certain, and the strength acquired before the end of October nearly guarantees the safety of the plants during the winter: at all events, we did not appear to lose ten plants from our September rows by the extreme severity of the frost and tantalizing hot gleams of sun, which caused more injury to many hardy shrubs than did the utmost rigour of the frost.

#### SALT, ITS USE IN GARDENING AND FARMING.

THE Roman naturalist, Pliny, is the first author within the scope of our reading who mentions salt, and he only alludes to it as a beneficial ingredient in food for grazing. In the seventh chapter of book 21 of his *Natural History*, he tells us, "that cattle have an avidity for a salt pasture, and that cows give more milk, and that the milk is much more pleasant for curdling into cheese, than upon ground not of a saline nature." It does not seem, however, that the Romans had ever been aware of the virtues of salt artificially applied to the growth of farinaceous food. John Glauber, the father of manipulating chemistry, about 270 years ago obtained a patent from the "mighty lords," as they were then styled of Holland, for the exclusive privilege of licensing the use of salt in agriculture. He had previously, in a work entitled *The Prosperity of Germans*, pointed out its wonderful properties. The reason why Glauber did not succeed, rested in a very simple natural property, which we will presently explain; and we have no doubt that Chemists of all grades will agree with us on *this* point, the most important we know in agriculture, on account of the mischief which a correct knowledge of the powers of artificial manure may prevent. To proceed, Old Markham, the Izaak Walton of agriculture, is the first English author who recommends salt for tillage. It is really wonderful how this man, so far back as the reign of James the First, instructs us in his *Farewell to Husbandry* (written on his death bed), of what ninety-nine of even scientific farmers at this day are ignorant. We will quote the passage entire, because it brings us to the point at which we were aiming.

"In all my former relations, touching the bettering of ground, I do apply, as one of my chiefest ingredients, salt-sand, salt-weeds, salt-water, salt-brine, ashes, and many other things of salt nature, as indeed all the manures and marles whatsoever, must either have a salt quality in them, or they cannot produce fruitfulness: so that it might be argued, if salt be the occasion of fruitfulness and increase, then there cannot be much hurt done by these overflows of the salt-water, that it should rather

add a fattening and enriching to the ground, than any way to impoverish it. But experience shows us the contrary, and that there is nothing more noisome and pestilent to the earth than the *superabundance* and too great excess of saltness, &c."

Our readers will be so kind as to mark attentively the word *superabundance*. Other early writers, such as Sir Hugh Platt, Christopher Packe, Lord Bacon, and Evelyn, praised the virtues of salt; but not one of them detected in those days its mischievous properties when used in excess, except Markham. Indeed this prime and elementary truth only became known to the scientific world, somewhat about the year 1700, by a remarkable expression of Lewenhoeck, in a communication to our Royal Society. We give his own words as they stand in No. 289 of the *Philosophical Transactions* :—

"There are some," says he, "that affirm, that the scattering of this salt water by the storm will do a great deal of harm to the fruits of the earth; but, for my part, I am of a quite different opinion, for I believe that a *little* salt spread over the surface of the earth, especially where it is heavy clay ground, does render it exceedingly fruitful; and so it would be if the sand of the sea were made use of for the same purpose."

Our readers will once more be taxed to fix their attention upon the word *little* in the above paragraph. In using the *salts* of any kind, all depends upon proportion, and we shall presently detail a beautiful experiment illustrative of this necessity. Hitherto we have alluded only to theoretical writers. Coming down some forty years later, we meet with practical men, and with none better than the *Practical Husbandman* published in 1738. A few extracts will show what was then known, and what ought to be practised now.

"Salt certainly sweetens the grass much; and it may, on all such occasions, be mixed with a proper quantity of dung, which is more sulphureous than salt, and will make grass shoot away much faster than any other manure. Lime, in its own nature makes grass *sour*, but when mixt with salt that acidity will be taken away.

"As to the proportion of salt to be used on land, it ought to be according to the nature of it; cold, wet, clayey land requiring more; and loose soft land, though it be poor, requiring less. Again, the proportion of salt ought to be either more or less, according to the crops of grass or grain you would improve. For cold, wet, and spewey land, ten loads of dung, *six* of earth, and eight bushels of salt per acre.

"For lean, hungry, sandy land, fourteen loads of poud earth, six loads of dung, and *six*

bushels of salt, per acre, when employed for corn or grazing.

"For meadow land, fourteen or fifteen loads of dung, *five* bushels of salt, and four of pond earth."

We have marked the words *six* and *five* in italics in the above paragraphs, because there has been for the last forty years, a tremendous mistake made in the use of salt, both as a manure and a top-dressing. Before, however, we can properly explain this mistake, we must give the experience of one or two other writers. Hitt, in his treatise on fruit trees, published in 1768, gives the following pretty experiment—the one to which we have already alluded :—

"To show an acquaintance of mine the effects and advantages of salt properly applied to vegetables, I made the following experiment, in an extreme dry summer, upon a bare piece of pasture land, out of which the cattle were all taken for want of grass: I marked four places with stakes, each of which I watered nine nights successively, in the following manner :—the first with spring water alone, to the quantity of a gallon; the second with the same quantity of water, adding an ounce of common salt; the third and fourth with the same quantity, mixing the water in the third place with two ounces of salt; and that in the fourth with three ounces, which produced the following different effects.

"The grass in the second place grew more, and of a darker green than that in the first; in the third, it only grew by spots, for part of it was killed where the greatest quantity of water fell, and the fourth was quite brown for a greater compass than the third; by which it appeared that an ounce of salt in a gallon of water had a better effect than the water had alone; and that three ounces of salt mixed with a gallon of water, was more than the grass could immediately receive; but the fourth place in the ensuing spring was the most fertile of them all."

Many people followed the practice prescribed by Hitt, and by a curious circumstance were misled as to the tenor of his instructions. To get close to the point, we must give a few words from Hollinshead.

"In deep, loamy, dry earth, upon which wheat has grown, after the crop is got in, the land should be ploughed, and lie in that state until the spring, when it must be cross-ploughed and wrought fine with the harrow, and planted with potatoes: as soon as the potatoes are covered with earth, then sow or spread *sixteen* bushels of salt per statute acre upon them; and when they are dug up in the autumn, then sow a crop of wheat again, taking care to pick all the potatoes clean out, that they may not in-

jure the wheat in the following spring by growing up amongst it. By this method of cultivation, a crop of wheat, and another of potatoes, may be produced alternately on the same ground *for ever*, instead of losing a whole year's produce, according to the old custom, whilst the land is in fallowing.

"For other corn lands sown in the usual way, after a spring ploughing, the best method will be to sow sixteen bushels of salt per acre, immediately after the grain is covered in by the harrow; this, by meliorating the soil, destroying weeds and insects, and attracting moisture, will produce an abundant crop; and by sowing ten bushels per acre *annually*, these lands will ever after be exceedingly productive."

Again—but we must once more task the reader to remark in the above as well as the following paragraphs that we have scored the word *sixteen* in italics. Our purpose for the minuteness will be presently discovered. — Legrand, in the "Annals of Agriculture," says—

"Having tried salt upon a small scale on a sandy soil, I can assert *sixteen* bushels to be a proper quantity for one acre. It gradually advances in its effects to *sixteen* and as gradually diminished to *forty* bushels when vegetation was destroyed. Twice only have I had an opportunity of buying a few tons of foul salt, and used it both times on a barley tilth, sowing the salt immediately after the barley. The event was perfectly satisfactory. The verdure of the spring exceeded anything of the kind I ever saw; and the ripened appearance was whiter by many shades than I ever beheld.

Beck also, who was gardener at Chorley, about the year 1800 we believe, is thus reported by Hollingshead.

"Mr. Beck, gardener in Chorley, has constantly made use of salt in his garden for upwards of thirty years, principally upon his onions: and he has invariably found the salt to exceed every other kind of manure which he could have used for the like purpose. His method is to sow the salt immediately after the seed is covered in. But as he never had any thought of communicating his observations and experiments to the public, he took no care to ascertain the exact quantity necessary to be sown on an acre, and proportionally upon any smaller quantity of ground: yet he thinks, if he might hazard a conjecture, that he has not sown *less*, and probably *more*, than *sixteen* bushels per acre. One year, by way of trial, he sowed the usual quantity of salt upon a plot of onions, *after* they had begun to show themselves above ground, and the crop, so far from being improved, was entirely spoiled; from this he infers, that the experimental gardener, who may be inclined to make use of salt, will do well to

throw it on as soon as possible after the seed is sown.

With such testimonials in favour of salt as a manure (and we have a thousand more on our table before us), what, it may be reasonably asked, has made it go out of fashion? Nothing but the *abuse* of it, arising from misconstruction and misunderstanding. At the time that Hollingshead and others wrote, there was such a high duty upon *pure* salt, that the use of it for agricultural purposes was out of the question. They spoke only of the *foul waste* from the salt works, which is not much more than a fourth of pure salt. Instead of *sixteen* bushels per acre of pure salt, the practice should not be more than *six* for corn land; and instead of *six* for grass land, not more than *three*. Hundreds of times have we heard farmers blame their own folly for being induced to use salt, because it burnt up the land—and well it might. It is a different thing to warm your hands by the fire, and thrusting them into it. This article has run to such a length that we cannot pursue it further at present. We should not have pursued it so far except for the elucidation of a simple truth, which every child who sugars his own tea may observe, and it is this—that moisture, whether in the shape of water, or as imperceptible particles imbibed by the soil, will only take up a salt and keep it in solution to the point of saturation. It is only from passing this point that farmers have made their land *arid* by salt, and the mistake has arisen, as we have explained it, by their applying the same rules which were laid down for the use of the waste from the salt pens in Cheshire to the use of the pure muriate of soda, as they now get it, at a cheap rate.

#### ON THE DISEASES INCIDENTAL TO CULTIVATED PLANTS.

EXTRAVASATED SAP. — Under this general name I purpose to include the consideration of gumming, bleeding, and other injurious affections under which plants occasionally labour, on account of their sap escaping from the properly containing vessels. The extravasation proceeds from the albumen, or inner bark, and may arise from four causes.

1.—The acrid, or alkaline state of the sap, which has been considered already, when treating of the canker. 2.—From plethora, or excessive abundance of the sap effused. 3.—From the unnatural contraction of the circulatory vessel. 4.—From wounds. 5.—Heat and dryness.

1.—In regard to the alkaline state of the sap, it may be observed, additionally, that the excessive alkaline quality of the sap, imparting to it the power of destroying the fibre of



its containing vessels, is placed on the basis of chemical experiment. A weak alkaline solution dissolves woody fibre, without alteration; and may be thrown down again by means of an acid. By this property we are enabled to separate wood from most of the other vegetable principles, as few of them are soluble in weak alkaline leys\*. It is true, that the vital principle may counteract powerfully this chemical action; but it will not control the corrosive effect of an active agent in excess, if repeated for any length of time. The blood of the human system contains, when in a healthy state, a portion of common salt; yet if this saline constituent is in excess, it induces inflammation and organic derangement.

2.—*Plethora* is that state of a plant's excessive vigour in which the sap is formed more rapidly than the circulatory vessels can convey it away. When this occurs, rupture must take place, for the force with which it is propelled during circulation, and consequently the force acting to burst the vessels during any check, is very much greater than could have been expected, before Mr. Hales demonstrated it by experiment. This distinguished vegetable physiologist found, that in the vine this force was able to raise 19lb weight. To the stem of a vine cut off about two feet and a half from the ground, he fixed a mercurial gauge, and luted it to the sides of the stem with mastic. The gauge was in the form of a syphon, so contrived, that the mercury might be made to rise in proportion to the pressure of the ascending sap. In this instance it raised the mercury to a height of thirty-eight inches†. The branch of an apple-tree was separated from the parent trunk, and placed in water. When the leaves were upon it, the force with which it propelled its sap, raised the mercury four inches, in a tube attached as to the vine; but a similar branch, deprived of its leaves, scarcely raised the mercury a quarter of an inch. The pear, quince, cherry, walnut, peach, gooseberry, and sycamore had a power equal to elevating the mercury, varying from three to six inches. The elm, oak, chesnut, hazel, willow, and ash elevated it variously from one to two inches. The laurustinus, laurel, and other evergreens, scarcely raised the mercury at all‡.

The experiments made with a separated branch do not give the full amount of the parent tree's power, because the exhaustion incident to amputation necessarily diminishes the vigour, and every minute the power in the

branch is less, because it is so much the nearer to death.

Now, we know, that a much less pressure than any of those abovementioned, would be capable of bursting the delicate membranes of any of their exterior descending sap vessels; and it is in such outer ducts that the injury first occurs. When one exterior vessel is ruptured, that next beneath it having the supporting pressure removed, is enabled to follow the same course, at the same locality, and in proportion to the length of the time the sap continues in excess, is the depth to which the mischief extends, and the quantity of sap extravasated.

If the extravasation proceeds from this cause, there is but one course of treatment to be pursued. Sever one of the main roots, to afford the tree immediate relief, and reduce the staple of the soil, by removing some of it, and admixing less fertile earthy components, as sand or chalk. This must be done gradually, for the fibrous roots that are suited for the collection of food, from a fertile soil, are not adapted for the intromission of that from a less abundant pasturage.

Care must be taken not to apply the above remedies, before it is clearly ascertained that the cause is not an unnatural contraction of the sap-vessels, because, in such case, the treatment might be injurious rather than beneficial. I have always found it arising from an excessive production of sap, if the tree, when afflicted by extravasation, produces, at the same time, super-luxurious shoots.

3.—*Local contraction of the sap-vessels.* If the extravasation arises from this cause, there is usually a swelling of the bark immediately above the place of discharge.

I have a cherry-tree in my garden, in Essex, of which the stock has grown very much less freely than the graft. Consequently, just above the place of union, a swelling, resembling a wen, extends round the whole girth of the tree, from which swelling gum is continually exuding. In the stem below it, I never observed a single extravasation. In a case such as this, the cultivator's only resource is to reduce cautiously the amount of branches, if the bleeding threatens to be injuriously extensive, otherwise it is of but little consequence, acting like temporary discharges of blood from the human frame, as a relief to the system.

4.—*The extravasation of sap from a wound* is usually the most abundant, and therefore the most exhausting; and, as the wound, whether contused or cut, is liable to be a lodgment for water, and other foreign bodies, opposed to the healing of the injured part, the discharge is often protracted. This is espe-

\* Thomson's System of Chemistry, vol. iv., p. 180, Ed. 6th.

† Hales's Veget. Statics, vol. i., p. 107.

‡ Ibid., p. 114, &c.

cially the case if the wound is made in the spring, before the leaves are developed, as in performing the winter pruning of the vine later than is proper. In such case the vine is always weakened, and in some instances it has been destroyed. The quantity of sap which may be made to flow from some trees is astonishing, especially in tropical climates. Thus from a cocoa-nut palm, from three to five pints will flow during every day for four or five successive weeks.

The best mode of checking such exudations is, by placing a piece of sponge dipped in a solution of sulphate of iron upon the discharging place, covering the sponge with a piece of sheet lead, and binding it on firmly. The sulphate acts as a styptic, promoting the contraction of the mouths of the vessels; the sponge encourages cicatrization, and the lead excludes moisture.

5.—Heat attended by dryness of the soil, as during the drought of summer, is very liable to produce an unnatural exudation. This is especially noticeable upon the leaves of some plants, and is popularly known as *honey-dew*. It is somewhat analogous to that outburst of blood which, in such seasons, is apt to occur to man, and arises from the increased action of the secretory and circulatory systems to which it affords relief. There is this great and essential difference, that in the case of the plants the extravasation is upon the surface of the leaves, and consequently in proportion to the abundance of the extruded sap, is their respiration and digestion impaired.

The honey-dew was noticed by the ancients, and is mentioned by Pliny (Hist. Natur. xi. 12) by the fanciful designations of the "sweets of the heavens," and "the saliva of the stars," though he questioned whether it is not a deposition from the air, purging this from some contracted impurity. More modern philosophers have been quite as erroneous and discordant in their opinions relative to its nature. Some with the most unmitigable asperity declare that it is the excrement of aphides; others as exclusively maintain that it is an atmospheric deposit; and a third party consider that it arises from bleeding, consequent to the wounds of insects. That there may be a glutinous, saccharine liquid found upon the leaves of plants arising from the first and third named causes is probable, or rather certain; but this by no means is conclusive that there is not a similar liquid extravasated upon the surface of the leaves, owing to some unhealthy action of their vessels. It is with this description of honey-dew that we are here concerned. The error into which writers on this subject appear to have fallen, consists in their having endeavoured to assign the origin of every kind of

honey-dew to the same cause, thus—The Rev. Gilbert White seems (Naturalist's Calendar, 144) to have had a fanciful and comprehensive mode of accounting for the origin of honey-dew; he tells us, "June 4, 1783. Vast honey-dews this week. The reason of this seems to be, that in hot days the effluvia of flowers are drawn up by a brisk evaporation, and then in the night fall down with the dews with which they are entangled."

The objection urged to this theory by Curtis (Trans. Linn. Soc. vi. 82,) is conclusive. "If it fell from the atmosphere it would cover everything on which it fell indiscriminately, whereas we never find it but on certain living plants and trees. We find it also on plants in stoves, and green-houses covered with glass."

Curtis had convinced himself that the honey-dew was merely the excrement of the aphides; and he supported his theory with his usual ability, although he justly deemed it a little "wonderfully extraordinary," that any insect should secrete, as excrementitious matter, *sugar*—he even thought it possible if the ants, wasps, and flies, could be prevented from devouring the honey-dew "almost as fast as it was deposited," to collect it in considerable quantities and convert it into the "choicest sugar, and sugar-candy." The bees, however, he found totally disregarded the honey-dew which came under his observation, a conclusion in which I do not agree, and which is also opposed to those of the Abbe Boissier de Sauvages, who, in a memoir read before the Society of Sciences at Montpellier, gives an account of "a shower of honey-dew," which he witnessed under a lime tree in the king's garden at Paris.\*

The various successful applications of liquids to plants, in order to prevent the occurrence of the honey-dew, and similar diseases, would seem to indicate that a morbid state of the sap is the chief cause of the honey-dew, for otherwise it would be difficult to explain the reason why the use of a solution of common salt in water, applied to the *soil* in which a plant is growing, can prevent the appearance of a disease caused by insects. But if we admit that the irregular action of the sap

\* A writer, in a late number of a GARDEN PERIODICAL, when relating some remarkable anomalies observed in the habits of the honey-bee at this season, remarks, in regard to honey-dew, "The honey gathering has indeed been very bad this year; in most parts of the country the average quantity of honey taken from each hive never exceeding one pound; but at one of my apiaries, where there are large woods of oak, and commons of heath and wild thyme, there was a honey-dew every morning for thirteen days in August, and when none of my stocks weighed in October less than 25 lb.; and one of this year's swarms, 32lb."—EDITOR.

is the cause of the disorder, then we can understand that a portion of salt introduced into the juices of the plant would naturally have a tendency to correct or vary any morbid tendency, either correcting the too rapid secretion of sap, stimulating it in promoting its regular formation, or preserving its fluidity. And that, by such a treatment, the honey-dew may be entirely prevented, I have often myself witnessed in my own garden, when experimenting with totally different objects. Thus I have seen plants of various kinds which have been treated with a weak solution of common salt and water totally escape the honey-dew, where trees of the same kind, growing in the same plot of ground, not so treated, have been materially injured by its ravages. I think, however, that the solution which has been sometimes employed for this purpose is much too strong for watering plants. I have always preferred a weaker liquid, and am of opinion that one ounce of salt (chloride of sodium) to a gallon of water, is quite powerful enough for the intended purpose. I am in doubt as to the correctness of Knight's opinion as to the mere water having any material influence in the composition of such a remedy, since I have noticed that standard fruit-trees, around which, at the distance of six or eight inches from the stem, I had deposited, at a depth of twelve inches, a quantity of salt to promote the general health and fruitfulness of the tree, according to the manner formerly adopted to some extent in the cider countries for the apple orchards; that these escaped the honey-dew (which infected adjacent trees) just as well as those which had been watered with salt and water. It is with much diffidence that I doubt the correctness of any of the opinions of such a man as the late lamented President of the Horticultural Society, for to him vegetable physiology is deeply indebted for many highly scientific, accurate, and interesting researches: he seemed, too, on all occasions, to introduce into his experiments an elegance of research and ingenious management worthy of the great class of organized substances to which he devoted his valuable life. Will not something be done towards showing the gratitude of his contemporaries?—some nook be found at Westminster for his tablet.

Hitt, who was a practical Gardener, and published his work upon Fruit Trees in 1755, after describing the honey-dew, and his ideas of its effect upon fruit trees, says, "If the season be wet, spread common salt over the border, about eight ounces to each tree, for the more salt the juices contain, which form the young plants, the more smooth and compact their leaves will be, and thereby less subject

to the penetration of the honey-dews than when they are composed of juices more watery.

Mr. Knight's experiments were made with a view of preventing the blue mildew, with which peas and some other crops are usually annoyed, especially the early and late sown; and by keeping the rows well watered, he perfectly succeeded, employing sometimes water alone, and on other occasions water in which "a small portion of common salt" was dissolved. By this process "I have constantly succeeded," he remarks, "in preserving the health of my autumnal crops of peas:" and although the applications were made to provide against the injuries of another disease, yet still certainly, in some degree, support the conclusions drawn by Hitt and myself as to the preventive power possessed by a weak saline solution. It is more than probable that most of the diseases of plants arise, in some way or other, from the irregular action of the sap, caused very often by sudden transitions in the temperature of the atmosphere. By a very easy experiment the cultivator may convince himself of the power of common salt in preventing these injuries—he need only strew it at the rate of about sixteen bushels per acre over a *portion* of a bed of cabbages or *boccoli*, &c., and when the frost sets in he will soon perceive how much more stoutly the salted plants withstand the effects of the frost, than those which have not been thus assisted. This result is produced very likely by the salt, after being absorbed by the juices of the plant, enabling the sap to withstand more effectually the congealing power of a low temperature, since the more salt watery fluids contain, the lower is the temperature required to render them solid. There are, also, most probably other ways in which the salt thus operates on vegetation, and with which we are but imperfectly acquainted.

#### THE CHEMIST AND HORTICULTURIST.

CHEMISTRY and Horticulture may now be fairly said to have shaken hands. The chemist no longer disdains to recognise a field worthy of his labours; and the Horticulturist is prepared to accept all the services which Chemistry may render him. Nevertheless, though no longer strangers to each other, they labour under the disadvantage of speaking different languages; and a few words from a mutual friend may not be amiss, to explain by what means this obstacle to their understanding each other may be removed. These may be very briefly described. The chemist must condescend to deliver himself less scientifically, and the farmer and gardener must dare to think more philosophically. We will begin with the

former in illustrating this piece of simple, but not unimportant advice.

There is hardly any phenomenon in nature which may not be explained in a great variety of ways, according to the length we go in tracing them to first, secondary, intermediate, or proximate causes; and, as far as it goes, each explanation may be equally correct. This variety of explanations, however, is a cause of much doubt and disbelief to the uninitiated, who cannot perceive that they are all derived from the same fundamental principle; and it would therefore be far better, in addressing them, to refer them to that principle at once, because it cannot fail to be one with which their observation on other matters has already rendered them familiar. In fact, the fundamental principles in the economy of nature are very few, and their action is so perceptible and diversified, that any explanation based upon them is comprehensible to the humblest capacity; whereas, elaborately tracing a phenomenon to some other phenomenon a few stages nearer to the prime cause, is not only unsatisfactory, but, involving the necessity of using a technical nomenclature, is, to ninety-nine out of a hundred, altogether unintelligible. Therefore, we repeat, when instructing the non-scientific, the chemist should refer them to the prime cause at once; for thus, though he may not enable them, like himself, to *demonstrate* that the phenomenon in question must be due to it, he will satisfy them that *it is so* (which is practically all that is wanted), just as you may satisfy a carpenter that two sides of a triangle are greater than the third, by referring him to the fundamental axiom that a straight line is the shortest line between any two points, without dragging him over Euclid's "asses' bridge" to prove it. Conversely, in explaining the effect of any cause, the chemist should at once show his horticultural pupil what nature has been about, by exhibiting to him her intention in the last stage of her operations; for, by howsoever elaborate a process she may work, she uniformly exhibits herself at last as having arrived at very simple means for accomplishing her object. Thus, with manures. Nothing can exceed, to the eye of a chemist, the elaborate ingenuity by which nature converts our common farm-yard manure into a food for plants; but a mere theoretical explanation of the process to a farmer unacquainted with the vocabulary of chemistry, and with the chemical properties of gases, salts, &c., is useless. It would afford neither amusement or instruction.

Show him, on the contrary, what nature has been aiming at, by exhibiting her at the last stage, when her preparation for feeding the plant is complete—show him that she has all

the time been labouring to render the vegetable and animal substances in the manure *soluble in water*, in order that they may avail themselves of the penetrating power and capillary attraction of that element to enter into the root and ascend into the body of the plant—and then he will perfectly understand what *he* ought also to aim at in the *artificial* preparation of manures, and in his own rude way will quickly rival the chemist, from his more frequent opportunities of observation in detecting what mismanagement defeats it, and what modes of treatment are calculated to aid it. To explain to him that too much fermentation neutralises this, or volatilises that, is only rendering phenomena which are invisible to his eye incomprehensible to his mind. The time may come when it will be otherwise; but *at present* simple means must be adopted to make the farmer familiar with chemical results before you burden him with chemical theories. Indeed, this is the proper, because the natural, mode of introduction to every science. In teaching a youth the science of mechanics, for instance, would you not make him acquainted with the effect produced by a mechanical power, before you attempted to teach him the theory of its action? By observation, indeed, thus properly directed, horticulture and agriculture may in time furnish us with self-taught chemists, as a pastoral life has furnished us with self-taught astronomers.

We have said, moreover, that not only must the chemist condescend to speak less scientifically, but that the farmer and gardener must begin to speak, or rather to *think*, more philosophically. For instance, in applying caustic lime to certain soils, how common it is to hear our most intelligent farmers speak of the lime as *destroying* the vegetable matter with which the soil is overcharged. When he comes to consider that the best, if not the only, means for *replenishing* an exhausted vegetable soil is the addition of decomposed vegetable matter, and that caustic lime not only decomposes vegetable matter, but fixes it in a state fit for the nutriment of plants by rendering it *soluble in water*, he will adopt a more correct phraseology; and the use of a correct phraseology in any science or business has more effect in giving a proper direction to our ideas than people in general are aware of. Whatever we may *mean* by a term, if it is erroneously applied, it will eventually lead others, and even ourselves, into errors of principle and practice. By the united efforts of the chemist and agriculturist in the method we have pointed out—the one to *simplify*, and the other to *improve* his language—they will quickly come to understand each other without difficulty or danger of confusion; and what is more, it will be the

first step of approximation towards their arriving at a language which shall be common to them both; and then, and not until then, shall we be fully justified in admitting AGRICULTURAL CHEMISTRY among the recognised and established sciences.

The writer of the above paper foresaw the progress which the application of chemistry to cultivation was likely to make if his views were followed out; and though written in 1837, very pointedly anticipated the doings of the present day. It is hardly too much to say, that the publication of the paper, and a series which followed it, did much towards the advancement of practical knowledge on the subject.

#### HARVEST HINTS.

HARVEST approaches; the wet weather may come or may pass over, and a most genial and bright August succeed to it; yet the rain has begun. The farmer is called by duty to be on the alert; and, among other operations, those of precaution claim great attention. In the rich corn districts of the southern and midland counties it is customary to place the sheaves in shocks of six, eight, or ten each; there they remain, the heads exposed to the pelting of every storm, with occasional turnings, perhaps, during the whole of a showry season, till, as we have too often seen, the ears mat together into a green mass of roots emitted by the grains. Is this the case in Warwickshire, Staffordshire, and Lancashire? In those counties, far less favoured than those of the south, do the farmers leave the shocks unprotected? What says the observant traveller? We have asked this question repeatedly; but, like all other questions put to the routine agriculturist, the answer returned amounted to a mere quibble or evasion.

They that will suffer must—they that are too stolid, or careless to appreciate, or listen to a well-meaning hint, must abide the consequences of their apathy. Nevertheless we will come to the charge again, and make a simple appeal to facts. It is admitted that in the wheat counties the modern farmer carries when and how he can—if one breadth be ready, he does not wait till the whole of his crop be in a like condition, but removes his sheaves to barn or rick, and secures them; while, in the north, many follow the unwise practise of leaving much in the field which might be carried, waiting for another portion to be in a fit state for the rick. This is an error, but though it be so, the farmer places only a few sheaves together, say four, their heads fixed close together, so as to occupy a small compass, and over these he inverts a fifth sheaf, the ears of

which hang downward, and the straw of the lower extremity acts as a thatch, covering and protecting the grain of the four standing sheaves.

It must be manifest to every person of reflection, that if a shock be set up thus in a perfectly dry time and be so hooded, the rain will be shot off, and the whole will remain dry as a bee-hive under a hackle. Some one, a few years since, it is stated, took out a patent for securing shocks of corn by passing a stake through a middle sheaf and driving it firmly into the ground; against this sheaf others were piled in a sloping position, the heads bearing against each other, while another was inverted and passed over the stake, which thus supported the shock against the force of wind, and held the hooding-sheaf firmly in its place. People laughed at the *patentee*, and at his expenditure of £100 for the privilege of driving stakes into the earth; but the idea was a good one, and the farmers of the fine wheat counties who shall have resolution so to secure and protect their corn while afield, will deserve the thanks of the community, and reap their reward in a far more solid form than did the poor fanciful *patentee*.

#### INJURIOUS INSECTS.—NO. III.

##### The Earwig (*Forficula auricularia*.)

THE Earwig is too well known to require any particular description of its outward appearance; but few persons are aware, however, that it possesses a pair of large and beautiful wings, which are carefully concealed beneath its short brown wing-cases (*elytra*), being first folded up lengthwise like a fan, and then re-folded across in two different places.

About eight years ago I observed no less than fifty earwigs, some with their wings still expanded, adhering to some fresh pitch, with which a wooden fence at Woolwich had been coated on the previous day. The earwigs were so close together, that I have no doubt they were flying in a swarm at night-time, when they came in contact with the pitch, which had detained them so tenaciously.

In April the Earwig sits upon her eggs—a curious fact observed by Frisch, De Geer, and Rennie, but which generally escapes notice. De Geer scattered the eggs of an earwig which he had placed in a box filled with earth, but she immediately collected them together again into one spot, carrying them one by one in her mandibles, and having placed herself over them, she never left them for a moment, but sat as closely as a bird does while hatching. The grubs, which nestle under their mother like chickens under a hen, greatly resemble her in form, but they are of a whitish colour.

"It is an unfounded popular prejudice that earwigs get into the brain by creeping into the ear; for though from being nocturnal insects, and disliking exposure to the light, they may, by chance, attempt to take shelter in the ear, the disagreeable odour of the wax will soon drive them out; at all events they could never get farther than the drum, which completely shuts the passage to the brain."—*Insect Transformations*, p. 103.

Earwigs are very troublesome in gardens and orchards, committing great depredations, during the night, among lettuces and other esculent vegetables, and on ripe fruit. Nothing, perhaps, is more disagreeable than to find them in fruit when it is brought to table.

The commonest method of capturing them is by putting the bowls of tobacco-pipes on the tops of slender sticks stuck near the trees and vegetables. At dawn the earwigs ascend the sticks, and retire under the bowls to conceal themselves during the day. In the morning, or just before sunset, the gardener carefully removes the bowls, and kills whatever earwigs he may chance to find under them. Sometimes, instead of tobacco bowls, a bundle of dry hollow bean stalks is placed in a tree, and burnt when it is supposed to contain any of these vermin.

But a better plan than either of the above is to take a quantity of cabbage-leaves, and render them quite soft, by baking them or holding them before the fire. Then rub them over with fresh butter or dripping, and lay them on the beds and in the sheds infested by earwigs, which will soon be attracted to them, and may be thus easily entrapped for destruction.

Rennie observes, that though vegetable substances seem to be the staple food of earwigs, they not only upon occasion show carnivorous, but even cannibal propensities; for he has more than once given a dead earwig to one confined in a box, and found that it devoured it; and a brood of young ones, reared by De Geer, ate the dead body of their own mother, as well as the dead bodies of several of their brethren. It has therefore been inferred, with considerable plausibility, that earwigs in some degree make up for their ravages by diminishing the number of other insects, though the nocturnal habits of the earwig render it not a little difficult to ascertain this.

*The Common Wasp (Vespa vulgaris, or Vespa Britannica.)*

Wasps feed upon various kinds of fruit, honey, the sap which exudes from the trunks of diseased elm and pear-trees, and also upon insects. "They are audacious robbers of bee-hives; and one wasp is said to be a match for three bees. This is partly owing to their reck-

less temerity, or courage; for they will boldly encounter evident danger, and one wasp will fearlessly oppose a whole host of bees, to filch a bellyfull of honey. \* \* \* Kirby tells us that a tradesman of his acquaintance calculated his loss of sugar in one year, by wasps alone, at £20 sterling. Wasps, besides, are insects of prey; and in France, Reaumer says the butchers are glad to have wasps attend their stalls, for the sake of their services in driving away the blow flies. For a similar purpose, the Americans suspend a hornet's nest in their parlours." Mr. A. H. Davis mentions, in the *Entomological Magazine*, that some wasps flew in at the window of a house at Snarbrook, in Essex, and devoured several moths which he had captured, and was preparing to preserve for his cabinet. He also mentions their seizing the common house-flies, and biting off their legs and wings. In some years, wasps are extremely abundant; and in others, but few are seen. Gilbert White notices that they were unusually numerous in Hampshire, in 1783. In the summer of 1833, they were very abundant in Aberdeenshire, where they devoured nearly the whole of the latest ripe red gooseberries.

It is seldom or ever that wasps continue in the same spot for two successive years, inasmuch as their societies do not hybernate as the ants do, being always broken up at the close of autumn, and all the population perishing, with the exception of a few females, which survive the winter. Out of three hundred females which may be found in one nest towards the close of autumn, scarcely ten or a dozen survive till the ensuing spring, at which season they awake from their hybernal lethargy, and begin with ardour the labours of colonization. \* \* \* The mother wasp (which is six times the size and weight of one of the workers,) is at first alone, and is obliged to perform every species of drudgery herself. Her first care, after being roused to activity by the returning warmth of the season, is to discover a suitable place for her intended colony; and, accordingly, in the spring, wasps may be seen prying into every hole of a hedge-bank, particularly where field-mice have burrowed. Some authors report that she is partial to the forsaken galleries of the mole; but this does not accord with our observations, as we have never met with a single nest in any situation likely to have been frequented by moles. But though we cannot assert the fact, we think it highly probable that the deserted nest of the field-mouse, which is not uncommon in hedge-banks, may be sometimes appropriated by mother wasp as an excavation convenient for her purpose. Yet if she does make choice of the burrow of a field-mouse, it requires to be after-

wards considerably enlarged in the interior chamber, and the entrance gallery very much narrowed. In case of need, the wasp is abundantly furnished with instruments for excavating a burrow out of the solid ground—as she no doubt generally does—digging the earth with her strong mandibles, and carrying it off or pushing it out as she proceeds. The entrance gallery is about an inch or less in diameter, and usually runs in a winding or zig-zag direction, from one to two feet in depth. In the chamber to which this gallery leads, and which, when completed, is from one to two feet in diameter, the mother wasp lays the foundations of her city, beginning with the wall. Kirby says, the female lays at least 30,000 eggs.

As prevention is always better than cure, one of the best means of exterminating wasps is to kill the large females in the spring, when they are searching for a suitable site for their colony. An anonymous writer in the *Gardeners' Magazine* says, that so effectually has he known wasps destroyed by killing the females early in the season, that where it has been done, there has not been a single nest near the premises, while other people have had them in abundance; and the *Maidstone Journal* once stated, that Earl Fitzwilliam gives a shilling for every wasp brought to him, dead or alive, in the months of April or May, and that his lordship pays more than five or six pounds a year in this way, which he considers a very profitable expenditure as regards the protection of his fruit, and honey-bees. At Claremont, it used to be the practice to give a half-crown for each of these founders of colonies; and it had the best possible effect. It excited the industry of the men; and we know one who has received the half-crowns for six in a week. However, the season for taking them is very short indeed, and too much assiduity cannot be used at that critical period.

When a wasp's nest is discovered, the inmates may be either destroyed by pouring gunpowder into the entrance, and then exploding it, or you may pour a small quantity of tar into the entrance, and then surround the mouth of it with tar, so as to entrap any wasps that may try to come out, or to enter the nest; or they may be suffocated by means of powdered brimstone.

It will often be found, in the end, a good plan to entice hurtful insects to some particular place for the purpose of destroying a great number at a time. I would advise gardeners to keep all their dead and rotten fruit suspended on a line, or placed in an open box in some particular corner of their gardens. A few caged blackbirds, thrushes, or other insectivorous birds, with a frog or two, might be placed

close by. The decayed fruit, being soft and juicy, would attract many insects, and these, flying about the cages, would become the prey of the birds and frogs. Perhaps they would not very readily seize the wasps, not relishing their sting; these, therefore, should be killed with a blow from a flapper, kept handy for the purpose; or a mixture of sugar and water, with the addition of some pepper, might be put in a saucer close to the banquet of rotten fruit. The pepper will effectually destroy them.

Strings stretched horizontally across a window, about an inch apart from each other, will deter them from flying into a hot-house or other room, provided there is no window immediately opposite to the one with the strings thus placed.

When stung by a wasp, suck the wounded part, if practicable, and then rub some drops of hartshorn into it, and the inflammation will be abated, if not prevented, or rub the part with the washerwoman's blue-bag, so as to rub a little into the wound before the swelling closes it up. This applied in time gives instant relief, we have heard chalk will do, and it is possible that it is the chalk used in the stone-blue that effects the cure, but we have the best proof of the efficacy of the blue bag which is generally already wet, for being stung twice within an hour, an old cottager applied the bag, rubbing it well for half a minute, the recent sting was cured so completely, that we did not feel the hurt, the other had swelled as large as half an egg, and the bag had but little if it had any effect.

#### The Red Mite, or Red Spider (*Acarus telarius*).

This insect infests the leaves of the grapevine, the peach, the melon, the cucumber, and various other plants, and increases with amazing rapidity.

Many suggestions for destroying it have been published, but most of them are useless, and some are positively absurd. Of the latter character is the recommendation of Sir Brook Boothby, who, in a communication to the Horticultural Society, advises that every leaf of a peach-tree should be plucked off the moment any red-mites are seen upon it! The remedy, in this case, would be worse than the disease. I shall, therefore, merely mention those receipts against it, which seem to have some tolerable chance of success. When several receipts seem efficacious, I think it advisable to mention them all, because what may be conveniently adopted by one gardener may be impracticable to another.

First,—Mix a small tea-cup full of soft soap with four gallons of clean rain water, heated to about one hundred degrees of Fahrenheit, and syringe the plants with it at about sunset.

Having done so for three days, omit it on the fourth, and use clean water instead, to remove the thin coating of soap from the leaves, to allow of the better respiration of the plant. On the following evenings repeat the use of the soft solution, for the same period as before, and then again wash off with clean water.

Second,—Take half an ounce of common soft soap, two table spoonfuls of sulphuret of lime, and mix the two ingredients together with an iron or wooden spoon. Then add gradually, a quart of hot soft water, and stir the mixture well with a painter's brush. Infested branches may be washed with this mixture when cool, or they may be pressed down and immersed in a shallow vessel containing it. It would be well to wash cherry and other fruit-trees with it, before they put forth their leaves and buds.

Third,—Mix two ounces of soft green soap, one ounce of common turpentine, and one ounce of flour of sulphur in a gallon of boiling water. Apply the mixture while warm to the plants.

Fourth,—Take some tobacco and slightly bake it on a cast-iron plate, and then, having tied it up in a piece of gauze or muslin, press it well in a gallon of boiling water. When the decoction is cool, add a little spirits of camphor and spirits of wine to it, and then let the infested plants, and whatever walls or wood-work may be near them, be well washed with it by means of a syringe. As tobacco is so often required in the destruction of insects, it would be as well if every gardener grew a small quantity for the express purpose.

Fifth,—A correspondent recommends that one or two table-spoonfuls of flour of sulphur should be mixed with three or four grains of gum-tragacanth (vulgarly called gum-dragon), dropping in a very little water, till an even paste be produced: then add water, to bring the sulphur to the consistency of cream; and in this state the particles of sulphur will diffuse themselves throughout the entire bulk of water, and may then be applied by the syringe. The sulphur, it is true, will be deposited in time, but by agitation it may be again brought into the necessary state of suspension. Syringe the leaves once or twice a week. When the red-mites infest cucumbers and melons, it has been found that merely drenching the leaves every morning with cold spring water, and then sprinkling flower of sulphur on them, soon rids them of these little pests.

Sixth,—When plants in pots are infested, place them, along with a quantity of bruised laurel-leaves, in a box or large vessel, capable of retaining the poisonous odour of prussic acid, which the laurel-leaves will then exhale. After remaining in this state about an hour, remove the plants from under it, and you will find that

the red-mites have dropped off the leaves. If a hothouse be infested, a quantity of bruised laurel-leaves may be shut up in it. For a house twenty feet in length by twelve feet in width, two bushels of laurel-leaves are, according to Mr. Ingram, found sufficient. They may be bruised inside the hothouse, the roof and sides being kept close with matting. The night-time is best for the experiment. I will not vouch that the insects are always *killed* by this treatment; because several moths, house-flies, and other insects, which I exposed last summer to the strong odour of bruised laurel-leaves, placed under a wine-glass, *appeared dead* for some time, but revived on exposure to a gentle breeze of fresh air in a garden. Mr. Gray, of the British Museum, says, that some *larvæ* of the common house-fly remained uninjured after two or three days' exposure to the odour of prussic acid. Mr. Peacock, a chemist, residing at Poplar, informed me that he himself, by exposure to a strong wind, recovered from the effects of prussic acid, which he had accidentally imbibed into his system. It, therefore, should be first ascertained how long a time the red-mites require to be subjected to the influence of the odour to place them beyond the possibility of recovery. J. H. F.

#### THE DOUBLE YELLOW ROSE.

(*Rosa Sulphurea*.)

MUCH has been written regarding this Rose of late years, and it is not my intention to enter into any discussion as to its origin, as has been done by Mr. Rivers, who considers it an accidental hybrid, of which the Austrian-briar is one of the parents. It has, however, several peculiarities attending it; it is very difficult to flower, and when it does flower, the flower bursts, or is destroyed by an insect; and it often brings to my mind the description of Shakspeare in his Comedy of Twelfth Night.

"But let concealment, like the worm  
I' the bud, feed on her damask cheek."

But this Rose, when well expanded, although without any scent, yet amply repays any little trouble which may have been bestowed upon it. The following hints may prevent disappointment in many instances.

The plant will not show flower until it has been well established in the ground, and suckers will be several years before they flower.

When once planted in a suitable situation, it ought not to be disturbed. I know a yellow Rose bush in this neighbourhood, which was planted where it now stands more than fifty years ago, which flowers as well as most yellow Roses do, and every second or third year is covered with flowers. It is planted close to



a wall, with a southern exposure, and is partly fastened back upon the wall, and part of it allowed to grow clear of the wall; and both parts flower equally well in a favourable season. The border had been forced when the garden was made, and is now mellowed down into a good garden mould, and bears vegetables, like any other portion of the garden.

The shoots are tender, and springing early, are apt, in my opinion, to be cut off by frost; and the buds being at the extremity of the shoots; in this case the Roses for the season are cut off. In consequence of this, I had no double yellow Roses last year, while this year, as there was little spring frost with us, there is a tolerable show of them. In consequence of this, it appears an object to prevent the too early pushing of the shoots; and a plant which I put in on the north side of a beech edge is growing well, and showing flower as well as its more favoured rival.

I am inclined, however, to think, that the best situation, unless a little protection be afforded to keep off the frost, in which case, a wall with a south exposure is preferable, would be at the foot of a wall, having a west exposure, the plant would not begin to shoot so early in the spring, and, as the hoar frost, which in general is the cause of injury, is melted before the sun strikes the plant, it will be much less injured than when planted on or near a wall having a south exposure.

The yellow Rose, also, sometimes bursts at one side, instead of blooming equally; this can be prevented by either opening the calyx or outer part of the flower with a sharp knife, or even with a pin, as is occasionally done with carnations by carnation growers. When the Rose is coming into flower, it had better be shaded, so as to prevent any injury from rain. I have seen this Rose flower well in a great variety of soils, from a strong clay to a good garden mould, and even a light mould, with a considerable quantity of sand in it, which is the quality of the soil where my Roses are growing. I observe some gardeners recommend a basin of mud to be formed round the roots, and that this should be filled, once in the twenty-four hours with water, but I cannot give any opinion on this, having never seen it tried. I mention it, therefore, merely that the gardener may, if he choose, adopt such a plan, such watering, of course, being given in the evening, when the plant is coming into flower, and while in flower.—*Jas. Heriot.*

#### THE ROSE OF PAESTUM.

THERE is every reason to believe that very few Roses were known to the ancient Romans, if we can trust to Pliny, who must be con-

sidered as the chief authority on matters of natural history; this would appear to be the case. It is curious that he should mention a hundred leaved Rose (*Rosa Centifolia*), but whether this is the same Rose known by that name at present may be considered doubtful, as, growing near Campania, in Italy, and near Philippi, in Macedonia; and he notices that Cipio, in the reign of Tiberius Cæsar, objected to its being placed in the crown of flower, then occasionally worn, except at the extremities, "like a hinge," from which it may be inferred, that these crowns were plaited with small or single Roses, and they would in that case be composed either of the *R. Gallica*, French official Rose of Loudoun, the *R. Sempervirens*, evergreen Rose, or the *R. Canina*, dog or hip Rose, which are the only wild Roses growing now-a-days in the neighbourhood of Rome. Flora Romanes of Lebas, Leon, and Maurus.

That Paestum, in Italy, was famous for its Roses is evident from that line of Virgil, "biferi qui Rosaria Paesti," the Rose beds of twice blooming Paestum, which also testifies, that the Roses which were cultivated there, bore a second crop of Roses; and this may be considered the first mention of what is now called "perpetual Roses." I observe that Mr. Rivers, if his *Rosa Paestana* has been imported from Paestum, says that it comes from the *Rosa Damascena*, or Damask Rose, but I have reason to think that he is mistaken on this point, as a few years ago, a friend of mine brought home two Rose plants, which he had obtained at Paestum, or to speak more correctly, as there is now nothing but ruins left of that place, on the spot where Paestum once stood, and which he gave to the nurserymen of the Highland Society, and these Roses turned out to be, not the *Damask Rose*, but the *Rosa Gallica* var. *rubra*, or the common Conserve Rose.—*Jas. Heriot.*

#### STANDARD ROSES.

THE great mistake which people make in the pruning of these beautiful subjects is, that they cut back the very first limbs to one or two eyes, however long they may have grown, and thereby keep the head small and pimping for years, whereas the first consideration ought to be to obtain something like proportion in the head. How frequently do we see Standards of five feet in height, with heads not larger than a respectable house mop. Cut, cut, cut, is the order of the day, and the lesson which is a good one of cutting the shoots to one or two eyes is acted upon before the tree has formed any thing like a proper sized head, whereas (though except in our practice we have not seen it even hinted at) the branches should be formed of a proper length all round before this

single eye pruning should be attempted. The best possible mode of treating the Standard Rose is the first season after budding, to pinch off the end of the shoot as soon as it is two inches or three inches in length, which sets it growing laterals at every leaf, and thus something like a head is formed the first year. At the end of the first year when the wood has ripened, they must be carefully pruned. Some prune in the autumn, but the spring is decidedly preferable, but only for this one reason: when they are pruned close in autumn, (as they frequently die back an eye or two), it will often cause a loss of some of the branches altogether, and if not pruned close, it is doing the work twice over, but where there is only the first years growth (from the bud) in a plant, it is less hardy than more mature plants, and it frequently happens that the ends are touched by frost; spring pruning therefore is decidedly preferable for this age. As there will be five or six branches, such of these as grow straight away from the centre and half form a circular head may be left on, while those pointing upwards may be shortened. Thus something like three or four limbs pointing different ways may be secured, but weakly ones must be cut right away. Those limbs which are left will not form a proper head, and therefore should be pruned back to three or four eyes, the end eyes to be left being under ones, will grow branching downwards, while the other three may grow right, left, or upwards. In pruning the next year, thinning out where there are branches very weak or very thick will be found necessary, but there must be no cutting back of the main branches that grow outwards; the head of a rose tree ought to be as large through as the stem is long from the ground to the lower branches. When the head is a proper size, the branches only require thinning out to give room, and the shoots of the year cut back to two eyes, and where they are too thick taken away close to the stem. This hint may be useful even to the rose growers for sale, though they may be excused for keeping their stock in the shape, it will best travel. The beauty of a tree rose may be seen in perfection only when treated as we have mentioned. It is quite necessary to alter the treatment a little when the roses are grown to exhibit cut, and the appearance of the plants is a secondary consideration, but, in a garden if we are to imitate trees, let us do so in earnest, and not fancy that proportion has nothing to do with it, for it is so great a mistake that a Rose grower who would never listen to our verbal hints, once called to see a collection of not more than twenty-four, could not restrain his admiration of the superior appearance of standards with heads of proper dimension. The

blooms are not so large, and the shoots of the summer never pass, and thus hide the bloom, whereas, always cut back to sizes, out of all proportion to the stem; half the Standard Roses hide, with their rampant growth of new wood, all the beauty of the flowers, which are smothered in foliage. Let these things be considered, let no time be lost in altering the system, and the very next season may exhibit great improvement.



ERICA CILIARIS.

ONE of the very pretty hardy heaths which may be found wild in Cornwall, but which is cultivated in gardens and shrubberies on account of its hardy qualities. The genus *Erica* comprises some of those hardy kinds though it must not be denied that those of the Cape, are not only far more numerous and beautiful. *E. Ciliaris* blooms in August, and is in its way a pretty object, as an evergreen shrub it is desirable at all times, and a collection of hardy heaths in a group or small clump on the grass looks pretty, as some one or other is in bloom the greater part of the spring, summer, and autumn. *E. Ciliaris*. *E. Prolifera*. *E. Strita* and *E. Cinerea* are purple, *E. Atropurpurea* is dark purple. *E. Alba* is white. *E. Carne*a is flesh color, and *E. Rubra* red. There are yet others which are equally hardy and desirable. The Hardy heath requires, a peaty mould such as will best do for the Cape heaths, and when found wild is generally on a spot well drained, very porous and sandy, as well as full of fibres, none of them will grow well except in a place prepared on purpose for them with all these requisites. *E. Ciliaris* blooms in August and may be raised from seed or cuttings.

## HINTS TO AMATEURS.

WHEN the attention of a person is first drawn

to horticulture, he does not know in what way he is most likely to obtain the objects he is so eager to attain, he begins without knowing what he ought to strive for; or, what is perhaps more likely, he commences his operations without any precise object in view, farther than to obtain, what will be obtained by all persons who direct their attention to any subject of natural history, a little temporary amusement; he will obtain his ends more satisfactorily by proposing an object to himself; for instance, the improvement of any particular flower; suppose for example, that he wishes to obtain a pre-eminence for his Tulips, his Carnations, or his Ranunculuses, his first thing is to obtain a small number of good plants, with which to begin his operations, he will probably conceive that in order to do this, he must purchase the newest and the dearest plants he can get, but the necessary consequence of such a proceeding will be, the outlay of a considerable sum of money; and as he will not understand the management of them at once, the probable loss of a good many plants, such a mode of proceeding would be inadvisable and foolish; and if the flower were the Tulip, one or more hundred pounds might be easily thrown away. Let such a person examine some of our garden periodicals, he will find in one or more of them a list of excellent Tulips, the price of no one of which cost more than half a crown a root; let him get his supply of roots at the proper season from any nurseryman of character; let him take a certain number of each kind, or what the Tulip growers name the *Roses*, the *Byblomens*, and the *Bizards*, and he may at the same time get a small quantity of what are called *breeder* Tulips; say that he commences with twenty roots of each kind, and perhaps with a few more breeders, this will give him employment for his first year, in preparing his bed, in laying up his plants, in protecting them from the weather, and shading them from the sun. There is no artificial heat required for this plant, and no expensive apparatus,—the chief outlay here will be for the roots at the commencement, and he will soon find his stock to increase. One Tulip grower speedily finds out another, his own stock is increased by the effects, and he will be glad to exchange his superfluous roots for the spare bulbs of his neighbour. I have selected the Tulip on this occasion, because it may be considered as the most expensive of the florists' flowers, and one on which much money may needlessly be thrown away, but before quitting this flower, I may mention an instance to prove that the advice above given will very soon put the amateur in a satisfactory situation in regard to the quality of his flowers. A small manufacturer in the west of Fife, has

been accustomed to lay out the small sum of three pounds annually in the purchase of plants, one year in procuring one species of flower, and the next year another species; yet this man commencing with such a small stock, for many years was accustomed to take the prize for Tulips at all the shows where his flowers were exhibited, and he produced flowers which would have been no disparagement to the shows in the larger towns of Edinburgh and Glasgow.

Until he has acquired some real good Tulips, we would by no means advise the amateur to breed Tulips, it will no doubt yield some amusement, but the chance is that the Tulips he then breeds will be good for nothing, and he will give up the business in despair: this, however, he need not do, let them wait quietly, until he becomes possessed of some of the finer Tulips, he will in this manner add to his amusement that of the breeding of the Tulip, and by selecting the seed only from the best varieties, he has a fair chance of doing so with success. He must not be dismayed at the probable length of time before his seedlings show their full properties, which Hogg says is seven years; if he fairly begins, and sows fresh seed every year, after the expiry of that time, he will have a fresh succession of flowers every year, and it is thus only the commencement which appears formidable: but if he objects to waiting for such a time before he can fully enjoy the production of fine Tulips of his own raising; he may turn his attention to flowers which become perfect in a shorter space of time, for example, Auriculas, Carnations, Piccotees, Pinks, Pansies, or Calceolarias, all of which exhibit their flowers in two years, and some of them within the course of a twelvemonth.—*Jas. Heriot.*

#### ON THE STRAWBERRY.

EVERY mode of practice that can be read tends to good, and the time is coming when this among others may be useful. If the ground be neither too light nor too stiff, the runners may be placed in four rows in drills an inch deep, and a foot apart each way; and when the plants have arrived at sufficient height, the drills may be moistened with liquid manure, or pure water, and levelled, and the earth should be brought up close to the plants, but not to cover their crowns.

As the roots will penetrate upwards of two feet into rich and loose earth, and as no manure is to be dug in beyond two inches below the surface, lest the roots may be injured, so the bed and the alleys must be trenched and highly manured before planting; in trenching, the upper spit must be thrown to the bottom,

and moist manure over it, and the bottom spit on the top to form a fresh surface.

But if the soil be a little too stiff (not clay, which is wholly unfit,) plenty of sifted coal ashes and stale manure must be dug in whilst forming the bed, to enrich and pulverise it; and, in that case, there should be only three rows, as it will be necessary to loosen the earth between the plants with a narrow spade in March, and afterwards to dig in manure within two inches of the surface, such as bone dust, woollen rags, soap boiler's ashes, poultry, or any other moist manure, to be washed down to the roots by the rains.

It has been stated by some persons, that it is improper to dig between the plants in March, as it cuts many root fibres; but it ought also to be considered, that the fibres will grow again in time to collect sap for the fruit, and that it is necessary to loosen a stiff soil.

When the earth is too light, a more adhesive soil must be added, and well incorporated with it.

At the commencement of blossoming, say from the first of May until the end of fruiting, plenty of lime, soot, or alder water to kill the insects; or liquid manure, or pure water, must be given three times a week, in the absence of rain, through the spout of a large watering pot, under the leaves.

When runners are wanted for fresh plantations, they should remain on the mother plants from March till the middle of July, when they must be planted out finally; in the mean time, the earth between the old plants should be loosened with a pointed trowel, and the runners pegged down to encourage their growth.

The runners that are not wanted must be constantly removed, as they greatly waste the sap to the prejudice of the fruit; and, also, those leaves should be clipped off, with shears or scissors, which can no longer raise sap—namely, the spotted and the large dark green ones, and those that are near the ground, for they all exclude the air, and impede the growth of the new ones, which are continually growing, to raise sap to strengthen the plant; but the small green ones of the size of half a crown, and the yellow leaves, and particularly those young ones that are near the fruit stems, must be retained, as they are raising sap for the fruit, and for their own support, and to strengthen the plant.

Those plants which have not blossomed should be dug up, and the vacant spaces furnished with others.

When Strawberries are planted in single rows on borders or elsewhere, or on a bed of three rows, they ought to be encompassed with moss or short grass in blossoming and fruiting time, to retain the moisture and to keep off

insects; and the moss or grass must be removed after fruiting time.

If a plant throws out too many leaves, and but few fruit stems, it should be rooted out, and its place supplied with a runner from a fruitful plant.

In September the strings and injurious leaves with their stalks should be cut out close, and the strings must not be permitted to grow again during the autumn or winter, as they materially waste the sap; the earth must then be loosened with a mason's trowel, or other sharp instrument, to the depth of two inches, so as not to injure the roots; and it would be well to spread between the plants wood, ashes, or flax dust, which latter, by its oily nature, destroys all insects that approach it; either of which may be dug in as manure in March; in the meantime, the yellow young leaves will have grown to their full size to strengthen the plants, and as a further protection from frost.

Late in February, or early in March, the strings, if any, and injurious leaves must again be removed to make room for the new leaves which are shooting forth beneath them, and the earth between the plants must be loosened lightly or deeply, according to the stiffness or lightness of the soil, and the manure dug in afterwards, as before stated, and the earth brought up close, so as nearly to reach the crowns; the beds should then have embankments of earth taken from the alleys placed at their sides and ends, to retain copious waterings and heavy rains, which embankments may be removed after fruiting time.

In three years the plants will be worn out, when they must be dug up after fruiting time, and the ground trenched, manured, and fresh planted in showery weather.

Strawberries may also be planted in rows three feet wide; and after the fruit has been gathered, and all runners and injurious leaves have been removed, the spaces between the rows must be well dug, manured, and planted with dwarf broccoli to come off late in February; when the vacant spaces will become footpaths until after fruiting time again.

The best situation for Strawberries, raspberries, gooseberries, and currants, are open and moist ones, and, consequently, they should be planted as near water as possible.

The experiment ought to be made of cutting down to within an inch of the ground, the fruit stems of some of the pines, as soon as their blossoms appear, and then to water and place close to them finely-sifted mould, in the expectation that they would grow again, and produce excellent fruit in August or September.

The blossoms of the alpine ought always to be cut off in April and May, and the injurious leaves removed; the earth must be loosened

and brought up close to the plants, which should then be watered, that they may bear fruit from July till the end of October.

To obtain a new variety of Strawberries, having the frequent bearing quality of the alpine, and the large size and fine flavour of the pine sort, it would be necessary to plant in the middle of July, during showery weather, on a bed, six feet long and four feet wide, two rows of runners of Elton's, or of any other large and high-flavoured pine: these pines may be sixteen inches apart each way; the whole should be covered with a small meshed net, supported by short stakes, as soon as the fruit begins to ripen, to keep off birds.

When the chief part of the over-ripe berries have dropped off, the net and stakes must be removed, and the plants taken up and well shaken on the bed to deposit seeds, and re-planted elsewhere; the bed should then be raked, and lightly covered with finely-sifted mould, and watered, and the net and stakes replaced until the plants appear.

The new plants, when arrived at sufficient growth, must be placed out finally to produce their crops in due season; and some shall be left on the bed to fruit earlier than the transplanted ones.

In this case, of sowing the seeds of the al-pines for a new variety, it will be necessary to encourage the growth of their blossoms in May, because in that month the blossoms of the pines are fully expanded.

The same procedure may take place respecting the al-pines and the large flat hantbois, as their leaves assimilate.

H. B.

*Salisbury.*

#### THE PROPERTIES OF FLOWERING PLANTS.

LONG after those papers which first laid down upon principles, the properties of florists flowers, and plants, were published, Mr. Paxton attempted to give rules in the form of "suggestions for determining the merits of flowering plants," and as he went into more general principles, and took a somewhat wider range, his remarks were expected to do that for general plants which had been already done for the better subjects selected by florists for improvement.

In selecting a few passages from his paper on the subject we especially direct attention to the sentences in italics. In the very first the writer assumes for the public in his day the ignorance of a previous century. For whatever may be said of beauty and taste, the public are very rarely mistaken in the real value of a plant, and design is much more busy in the overrating a subject than ever public taste has been. Witness the plants which are favourites at market. Is there any

indication of ignorance there? Will not certain plants which have real claims to be considered beautiful, sell rapidly and well, while others more novel, more costly, and more scarce, will not find customers at any price? Look to the thousands and tens of thousands of Camellias, and Gardenias that find customers at Covent-Garden among the people who are not gardeners, but who prefer them without knowing why; the fact is that the public are good judges; place nine-tenths of the orchideous plants by the side of a *Camellia Japonica* at the same price, and see how many times the latter would be sold and replaced before anybody would look at the former with any desire of possessing it. Look at the plants which generally find favour with the public; the *Epacris Grandiflora* will sell in ten times the number that any of the others will, and why? Simply because it is a better plant, a handsomer flower, and a better habit. A noble double stock is prized, while your botanists' single ones would not be taken by a common costermonger at a gift. It is not because the grower recommends it, but because they like it better. It is the growers and sellers who overrate plants, not because they think what they say, but because having bought a thing on speculation and propagated it they must try to sell it, but nothing ever wronged the public taste more than setting it down as deficient in the matter of flowers and plants; common purses may dictate common flowers, but whatever flower it may be, those who bring the best at the price will sell most. Take fuchsias, where there is one other sold there are scores of globosa, and which think ye the very mechanic would choose at the same price? Globosa or St. Clair? Take geraniums where the florist is rather more dainty than in some others: which plants are the greatest favorites with the people? The best at the price they can afford. The rising sun and coronation, when sold at the market price of plants would be picked out from hundreds, and the scarlets, the old (and by some people who fancy they know a little, the neglected) scarlets, will always maintain their places, not merely because they are good plants, but because the public who are good judges know they are good, and it is useless to try persuasion on them. However Mr. Paxton has some proper notions, notions entertained by the public, and therefore indisputable, others somewhat novel, and these are the only ones that are not proper. We have selected a few truisms, and some few remarks that we dispute the propriety of altogether. He says:—

The first thing which attracts the attention of the observer of a flowering plant is its blossoms. If these are very numerous, conspicuous, and of a brilliant colour, all other characters are some-

*times forgotten, and it is pronounced valuable.* But when the flowers have faded, the plant occasionally proves to be a meagre, or even unsightly, object; and in this state it continues throughout the greater part of the year. This is a case in which the impropriety of judging the merits of a plant by its flowers alone is evident. Instances of a contrary nature might be adduced to show that where the flowers are small and inelegant, the general appearance of the plant may yet be ornamental, and remain so perpetually. Again, if the foliage be taken as a criterion in the absence of flowers, similarly wrong conclusions may be deduced.

To determine with any degree of accuracy the general character of a plant, *every feature must be strictly scrutinised.* A really beautiful object of any description is one in which *all the parts* are in some measure conformable to each other, and this is precisely the case with plants. Symmetry and harmony of outline, though essential, are *quite insufficient to constitute beauty*, unless every component part contribute distinctly and individually to create that harmony. A large, gross, and uncomely flower, surmounting a slender and naked stem, is certainly far from being a graceful object. In the same manner, an insignificant blossom, buried beneath a dense mass of noble foliage, excites feelings completely adverse to those of admiration.

Leaves are technically termed *coarse* when they are large, with great and numerous inequalities on their surface, and covered with strong hairs, bristles, or aculei. Neither of these characteristics are independent criteria; and size, especially, is frequently co-existent with real beauty, when unaccompanied by any other detractive quality. Unitedly, however, they constitute the coarseness above-mentioned; while precisely the contrary properties are necessary to true elegance or handsomeness. Their colour, whether it be of a light or deep shade, should be lively and clear; and this is particularly desirable when the plants are what is termed evergreen.

As the appearance of flowers is considerably deteriorated by association with insignificant or slovenly foliage, so, in a much greater degree, *fine foliage alone can never compensate for the absence or inferiority of blossoms.* Flowers are and must be regarded as the greatest ornaments of a plant, however fugitive they may be. It is important that they stand out boldly and advantageously to view, that their form be somewhat symmetrical (though this must be taken in a very latitudinarian sense), but chiefly that their colours should be clear, bright, and agreeable.

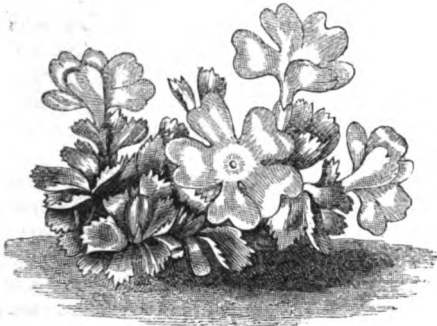
*Nothing, we believe, determines so much the opinion of an observer of a plant, as the colour of its blossoms.* But this, when viewed apart

*from other considerations, proceeds from an erroneous and puerile taste.* Hence, so many shabby looking and really uninteresting plants acquire a degree of notoriety purely artificial, and which invariably subsides when the novelty of its object has ceased. By this means, also, persons of correct taste wholly disregard popular declarations, and many highly valuable plants are thus retained in that state of obscurity which their injudicious and incompetent appraisers alone merit.

The preference for certain colours is a question which individual taste can decide, although some are almost unanimously voted vulgar; but the characters herein depicted are essential to real beauty. If the persons who cultivate plants for sale, and those who in any way describe them, would bear these principles continually in mind, their opinion would be regarded with greater deference and confidence, and the diffusion of floricultural taste and practice would be greatly facilitated, nor could it be otherwise than useful to the general cultivator, *particularly to those who are frequently called upon to decide the merits of plants at horticultural exhibitions*, as they would thus acquire that stability and assurance of judgment which would ensure a cheerful acquiescence in their award.

Mr. Paxton throughout wofully under-rates the taste of the public; we deny that symmetry and harmony of outline are "quite insufficient to constitute beauty;" we are a little puzzled to get at Mr. Paxton's notions as to what may be "gross and uncomely," when he says that "a large, gross, and uncomely flower surmounting a slender and naked stem, is certainly far from being a graceful object." Who is to understand what he means to convey by his terms "gross and uncomely?" A tulip is a large flower, and it is upon a slender stem; if he calls that ungraceful we must join issue with him, for we opine there is nothing more graceful. He says too, that "to determine with any degree of accuracy the general character of a plant, every feature must be strictly scrutinized." Now this we hold to be sheer nonsense, the "general character" of a plant may be determined with "great accuracy" (if such terms be admissible in speaking of general character) without examining any more than the "general" features, and generally speaking we object to the cheapness of price at which he holds that which every flower market in the kingdom proves to be paramount—public taste. We are happy to recognize among the most illiterate classes a pure taste in the matter of flowering plants, and if one-half the buyers knew how to put their thoughts to paper, they could beat Mr. Paxton out of the field, by informing us in plain, home-

ly, understandable language why they prefer the best, for that they do is obvious.



PRIMULA MINIMA.

THE whole tribe of *Primula* may be fairly called pretty, nearly all hardy, and they comprise a very extensive variety of dwarf herbaceous perennials. The species before us is a neat little rock plant, perfectly hardy, bearing flowers, varying a trifle in shade, but, all more or less red, with a black tinge upon it. It was introduced from the south of Europe in 1819, and is among the most desirable of the plants for rock work. It flowers in April, and may be therefore placed among the earliest of our spring varieties. It seeds readily, but is increased by parting the roots, nearly seventy kinds are mentioned in first rate catalogues, to say nothing of there being what are called distinct species, and among these many branch out into hundreds of varieties. We observe among these but three greenhouse species, *Fimbriata Alba*, *Fimbriata Rosea*, and *verticillata*. The subject before us is characteristic of the genus and very desirable in its place which must be high on a bank if not on rock work to succeed well.

#### VEGETABLE EARTH AND MINERAL EARTHS.

To analyse soils is peculiarly the province of the operative chemist; but when this task is completed, however successfully, nothing useful is achieved without the additional means of ascertaining the properties of the ingredients which enter into their composition. Now, of the various substances which chemists classify under the term of *earths*, there are few which have not already been found to be nothing more than mineral oxides; that is, minerals reduced to their present appearance by the mere absorption of oxygen, and the presumption is that all are so. Thus, Sir Humphry Davy reduced potass to its primeval mi-

neral state, from which, on being allowed to absorb oxygen from the atmosphere, it immediately reverted into potass again. But above these *earth* we everywhere find (except it be washed away by rain or removed by other causes) a light coat of mould, which used to be called *garden earth*, but for which we hope to find a more appropriate name. It is in this portion of the soil that we know the principle of fructification to reside; and that, even when mixed up with other earths, as in some degree it always is, vegetation is luxuriant according as it predominates. Now, this earth differs entirely from the earths classified by chemists, inasmuch as it is not the mere oxydisation of a mineral, but the decomposition of vegetable and animal matter. That such is the case we might fairly infer from daily observation; but Buffon gives us a remarkable proof on a large scale. "I have frequently observed," he says, "on a Roman way, which crosses Burgundy for a long extent, that there is a bed of black earth of more than a foot thick gathered over the stone pavement, on which several trees of a considerable size are supported. This I have found to be nothing else than an earth formed by decayed leaves and branches which have been converted by time into a black soil." Looking then to the vast difference between the bases of the *mineral earth*, and the basis of this "*vegetable earth*;" and looking to the simple and uniform means by which Nature ever re-produces vegetable life, it is by no means an extravagant, though novel, suggestion that the vegetable earth alone is the store from which vegetation is renewed, and that the mineral earths, to say the least, are *inert* in the process. From the latter, what can the vegetable draw proper for its nutriment, except their oxygen; against which there are two objections, first, that their affinity for their oxygen is probably too great for the calls of vegetation to overcome; and secondly, that Nature, who, however bounteous, wastes nothing, has already supplied the vegetable with a ready and easy supply of oxygen from the atmosphere. That plants will become tinctured by mineral solutions is true, but it is equally true that such a tincture contributes to anything but to their nutriment.—Well, allow that the mineral earths must be inert in vegetation, as all direct reasoning and natural analogy should induce us to conclude, and from thence it is no great stretch to suppose that some of them at least may be positively deleterious. But if so, why do we so frequently, and with so much evident success, mix mineral earths with the staple vegetable earth, to the improved fertility of the latter? Why, for instance, to some light loamy lands do we beneficially apply clay (alumen) as a

manure? This question must be answered by another, upon which the whole problem depends. Do the mineral earths, after all, act on the vegetable earth as *manures*? Do they not act in a different and more simple manner? There is no obvious reason why they should act *positively* as a manure, but there is a strong natural reason why they should act *negatively* by another process. We always find the vegetable earth, wherever the hand of man has been, alloyed with some mineral earth; and, if our supposition be correct, that a mineral earth *per se* is injurious to vegetation, it is the essence of noxious matters that there are others of the same kind which, from their very affinity, they seize upon and render inactive; and in this manner the application of a mineral earth may assist the vegetable earth, not by positively adding to its powers of fertility, but by *neutralising* some other deleterious earth with which it is already charged. And now it may be said, what does it matter practically whether the application of a mineral earth acts by manuring or neutralising, because the effect is the same, call it by what name you will? Everything. You manure with the mineral earths *blindfold*. You may neutralise by them (if that be the true nature of their action) *with certainty*. After the operative chemist has taught you how by analysis to detect what mineral earth predominates in your soil, it will cost him a great deal less ingenuity and trouble to teach you what other mineral earth will counteract and render it quiescent. There would then be no risk of doing harm instead of good, as is now too frequently done even with that best understood of all preparations, lime. Other advantages might be pointed out, but this is so palpable and important, that the subject had better be here dropped for the present.

#### GARDENS OF PARIS,

##### NO. I.—JARDIN DES PLANTS.

It has long been a matter of much surprise to foreigners visiting London, that one of the most affluent cities in the world should, in the 19th century, be without a Botanical Garden, whilst Paris, Montpellier, Marseilles, Toulouse, Tours, Orleans, Madrid, Lisbon, Brussels, Haarlem, Amsterdam, Vienna, Berlin, Dresden, Milan, Rome, Florence, Padua, Turin, Naples, and even frigid St. Petersburg, each are endowed with their national Jardin Botanique.

This does not arise from any want of taste on the part of the British nation for the delightful study of Horticulture, Floriculture, and Botany, as no country in the world can boast of more magnificent gardens, laid out with a

splendour and study of nature that has caused her nurseries to be copied by the whole of Europe; and when a foreigner gazes on the magnificent grounds of Sion House, Chatsworth, Kew, the Royal Botanical Society of London, and the extensive nurseries which adorn the environs of the metropolis, he is struck with amazement at British horticultural perfection, and the little encouragement given by Government to promote that science among the people.

The study of horticulture in France dates from the time of Louis XIV., called *Louis le Grand*, which monarch, although he carried the arms of France victorious over the north of Europe, made horticulture to become a national emulation, by turning the arid and sterile country around Versailles, under the superintendence of the celebrated Le Notre, into one of the most splendid palaces and gardens in the world. Marly, St. Cloud, Meudon, Fontainebleau, the Luxembourg, the Tuilleries, and the Jardin des Plantes, are indebted to that great king for their present magnificence. The example shewn by him in the cultivation of nature, gave a sudden stimulus to his nobles, and in a few years the environs of Paris, which had hitherto been nothing but uncultivated marshes, soon were transformed into delightful gardens, displaying the most exquisite fruits, flowers, plants of the rarest kind, as well as vegetables; which example was followed by the late Emperor Napoleon and Empress Josephine, and by his present Majesty Louis Philippe and his family, who may be justly called the "Royal Gardeners," as they not only practice it themselves, but patronise every horticultural and floricultural institution throughout the kingdom.

The BOTANIC GARDEN of PARIS, which is the admiration of foreigners, is the most extensive for the diversity and rarity of its collections of any in Europe; and its splendid museum of Natural History is not to be equalled in the world, which causes the French nation to look upon it with a glorious pride.

Louis XIII. was the founder of this garden in 1626, by granting a few roods of barren ground at the extremity of the Faubourg St. Victor, to be turned into a drug or narrow botanic garden, with only three professors and one demonstrator; but as soon as Louis XIV. ascended the throne, in 1660, he made a very large addition of ground, and had extensive conservatories, herbariums, green and hot-houses, and a cabinet of natural history and spacious lecture-rooms erected, and the whole laid out and planted in the most scientific manner, and appointed the most celebrated men of the day, with handsome salaries, as professors.

The centre of the garden is 84 arpens, and



appears to the eye in entering as divided into three departments, containing fountains, woods, meadows, and mounts, variegated with majestic trees, flowers, and plants; at the end of which avenues, coming through the massive bronze gates facing the river Seine, the splendid gallery of natural history attracts one with wonder and admiration. On each side the gravel-walks are convenient stone seats and towering shady chesnut and elm trees, interspersed with pines, yew, hazel, laurel, myrtle, jessamines, eglantine, lilacs, honeysuckles, rosemary, lavender, and other shrubs, emitting a most delicious scent. The ground is laid out in the most fanciful and picturesque parterres, interspersed with gravel paths and delightful variegated borders; in the centre several crystal fountains throw up their refreshing sprays, whilst the golden fish are gaily sporting within the basins. One part of the garden is devoted solely to botanical plants, which contains a growing collection of nearly 30,000 species, all carefully ticketed and divided according to the different parts they may be indigenous to. The next is for flowers and exotic hardy plants; and the third for vegetables of every description, native as well as foreign. In the magnificent avenue of forest trees, the coffee tree, the chesnut, which was originally brought from India; the acacia from North America; the juniper from the Levant, which is upwards of 45 feet in height; the palm, the tall pine of America, the poplar, elm, oak, ash, and numerous other species of trees, the growth of France, America, and other parts of the globe, rise majestically their fine green foliage. The next collection of trees, the growth of France, each distinctly separated from one another, according to their nature and growth, and an extensive collection of foreign hardy trees in the same order. The flower-garden is most select, containing the rarest species of native and foreign plants of many thousand varieties. The whole is arranged according to the natural method of M. de Jussieu—trees, flowers, and plants being all ticketed with their name, genus, and class. In the middle is a neat Chinese building, for the purpose of the breeding and studying the nature of the bee and the silk-worm, and the hives most suitable for their industry. In the next building is a collection of the different soils suitable for grain, fruit, flowers, and vegetables; and over it a glass gallery, containing models of hedges, labyrinths, and artificial enclosures, with a most curious selection of graftings, in which are seen various fruits growing on the same tree and branch. There are six hothouses on a most spacious scale, according to the degree of heat required for the various plants. The largest is for tropical plants, and is divided into

three departments. The first was constructed by the celebrated Buffon, and is heated at 12 degrees. Among the plants are the cocoa tree, the tea tree, the cactus, on which the cochineal feeds, the indigo plant, sensitive plant, banian or palm, the mahogany, the *ficus elasticus*, the milk of which produces caoutchouc or India rubber, the sugar cane, and numerous other tropical trees. The lower apartment, *Serre Baudin*, is also kept at 12 degrees, for the cultivation of the most curious herbaceous plants, among which is the *Xylophilla*, whose flowers bloom on the borders of the leaves, the pomegranate, &c. In the third, named *Serre Philibert*, is the wild bread tree, the mace and nutmeg tree, cocoa, &c. The large exotic shrubs and trees grow in that one raised by Dufay, which is heated at eight degrees; and the next for feculus plants is heated at three degrees. On the right is the *Serre du Cafier*, where was raised the first coffee plant which was sent as a present to Louis XIV. by the King of Holland from Leyden, and its berries were planted at the Antilles, Isle Bourbon, and other French colonies, which has turned out so rich a production. There is the sago plant, palm, date, &c.; this is also at 12 degrees. In the next hothouse, raising in the form of a glass lantern, forty feet high, called *Cierge du Peron*, is the cycus of India and Japan, the fan palm, the *Passiflora elata*, the branches of which extend 50 feet along the roof, and is in flower eight months of the year. The other conservatories are for flowers and fruits. The *temperate house* is 200 feet long, 24 feet wide, and 27 feet high, and is only heated when the thermometer descends outside to below zero. This is appropriated to trees and plants growing in the boreal hemisphere, New Holland, Van Dieman's Land, Cape of Good Hope, New Zealand, &c.; among which are to be seen the centennial aloe, the cotton tree, the palm of Sicily, 25 feet high, two of which were made a present to Louis XIV., and a numerous collection of the rarest productions of those climes. The *Swiss Valley* is one of the most delightful spots leading to the winding mount, which forms a maze, planted as a labyrinth of alleys, formed of stately pines of America, and other shady trees, on the summit of which is a splendid *kiosque*, or summer-house, from whence one has a most extensive view of Paris, the serpentine Seine and Marne, Mont-Matre, the fortress and wood of Vincennes, the plain of Tori, the cemetery of *Père le Chaise*, formerly the residence of the confessor of Louis XIV., and now forming one of the most picturesque and extensive grounds for the deposit of the departed, being 84 arpens; the whole presenting a *coup d'œil* not to be equalled. The inscription on the

detonating meridian, over which is placed a small cannon, which goes off exactly at twelve o'clock, as the rays of the sun strike upon the touch-hole, is *horas non numere, nisi serenas*. In descending, is a small granite monument, surrounded with minerals, in which is enclosed the mortal remains of the celebrated Daubenton, who sacrificed fifty years of his life as professor of mineralogy and geology in the cabinet of these gardens. The collection of orange-trees, citrons, lime, fig, mulberry, almond, and other greenhouse or stove plants, is very extensive. There is a splendid specimen of the cedar of Lebanon, which was planted in 1734, by the celebrated Bernard de Jussieu, who imported it from England. In the valley Suisse is the menagerie, which is 229 toises long, and 110 toises broad, containing a very superb collection of animals and birds, from the elephant of Asia and Africa, and the Giraffe (made a present by the Pacha of Egypt to the king), the bison, or wild bull of America, the noble lion and ferocious tiger, to the gentle Merino lamb, Cachmere goat, and the playful monkey; from the carnivorous vulture, the variety of pheasants, and every description of aquatic birds, to the chattering parrot. Each species are either separated in dens, or in the most tasty houses, surrounded with young trees and shrubs. The cabinet of Natural History is a most spacious and magnificent building, two story high, with a *façade* facing the gardens of 290 feet. The ground floor is a gallery, containing every description of agricultural and horticultural implements, or their models. The collection of stuffed animals is upwards of 20,000, and 5000 species of *mammifères*; 6000 birds of 2300 species: fish, upwards of 5000, of 2500 species; butterflies and insects to many thousands, from all parts of the world, as well as fossils, petrifications, and mineralogical productions, too numerous to mention, and a library of 15,000 volumes. The Botanical Gallery, upwards of 25,000 varieties of herbs, and an extensive collection of every description of fruit, modelled in wax, contained in twenty large glass cases. The Cabinet of Compared Anatomy, commenced in 1775, under Buffon, and continued by the celebrated baron Cuvier: it contains upwards of 12,000 anatomical subjects in the fifteen rooms. Lectures on agriculture, horticulture, botany, natural history, zoology, geology, and anatomy are delivered publicly, gratis, by the most learned men in the profession; and the gardens, as well as the menagerie, are open daily to the public, and also all the cabinets, for those who are inclined to study the sublimity of nature.

#### BEE KEEPING.

GARDENERS who have their residence in a

garden, should never fail to keep bees. It is by no means necessary that they should carry on this to a great extent, but a hive or two on a stand forms a pretty object, and often turns out profitable. There are numerous books on this subject published at all sorts of prices, but probably the Apiarian's Guide is as good for a cottager as any other. It is simple, yet comprehensive; it communicates all that is necessary and not more. In the meantime, the following compilation introduced with part of the first chapter of the Guide, may be sufficient for a beginner.

**SITUATION OF AN APIARY.**—A south aspect is decidedly preferable to any other situation for an apiary. I have tried various aspects, but the bees in the south I have always found to be the healthiest, and to collect the largest quantity of honey. It is very important that the hives be sheltered from the wind by trees or houses, and that they are not placed in the vicinity of ponds or large rivers, for high winds will dash them into the water, where numbers will perish.

It was the opinion of the ancients, that bees in windy weather carried weights to prevent them from being driven about by it. This is now ascertained to be erroneous, and is ascribed by Swammerdam and Reaumur, to preceding observers having mistaken the mason-bee for a hive-bee; the former builds its nest against a wall, with a composition of gravel and its own saliva, and when freighted with the former article, may easily have led a careless observer into the erroneous opinion alluded to. The Abbe della Rocca appears to have fallen into, and perpetuated, the same error.

Though large ponds are very injurious, a small stream is beneficial to them, which, if they are not supplied with, water must be given them, for it is absolutely necessary, and enters, as much as honey and farina, into the composition with which they nourish the brood. The plan that I have for many years adopted, is to fill an unglazed earthen pan, eighteen inches by eight, four inches deep, and square at the sides, with water, upon the surface of which floats a very thin deal board perforated with holes: in spring and summer the bees may be seen coming in great numbers to drink, or rather to carry water into their hives to mix with the farina they collect so abundantly at this season of the year for food for their young. In my opinion, Dr. Bevan says very justly, that "the apiary should be near the residence of the proprietor, as well for the purpose of rendering the bees tractable, and well acquainted with the family, as for affording a good view of their general proceedings."

I am a decided enemy to bee-houses of all kinds, for they are the means of causing the

ruin of a great number of hives, by affording a home to their worst enemies, viz., mice, moths, spiders, earwigs, and various other insects; thousands die from imprisonment, and many hives are destroyed by humidity. The method of placing several hives upon the same bench is also very injurious; it very much facilitates pilfering, and renders it impossible to operate upon one hive without disturbing the others.

The hives should be placed upon separate boards, supported by single pedestals four or five inches in diameter, firmly placed in the ground, and standing about fifteen inches from the surface; upon the top of this post should be nailed firmly a board nine inches square, upon which should be placed the board the hive stands upon, but not nailed; the double boards will be found very convenient for weighing or removing the hives, without disturbing the bees.

On no account use clay or mortar, as is usually done to secure the hive to the board. the bees of themselves will do it more effectually; \* clay or mortar tends very much to decay the hives, and to harbour moths and other insects; each hive should be covered with a large milk-pail, and be well painted every year, for hives managed upon the depriving system are expected to stand from fifteen to twenty years.

The hives should be placed about three feet apart from each other, and in a right line, but should the number be too great to allow of this arrangement, and render two rows necessary, they must not be less than fifteen feet asunder, and those in the front row intersecting the line formed by the hinder one.

The boards on which the hives are placed should be cleaned about four times in the year—January, March, April, and November—much time and trouble will be saved the bees thereby.

Plants which rise in height equal to or exceeding the entrance of the hives, should not be suffered to grow in their immediate vicinity, and every facility should be removed by which the enemies of the bees can ascend into the hives.

Still, however, a few shrubs or standard roses of four or five feet may with advantage be placed eight or ten paces in front of the hives, for the bees to alight upon in their return home when heavily laden with honey and pollen—it saves their falling to the ground from the weight of their load, which they fre-

quently do, and in unfavourable weather to rise no more.

I have always found the advantage of planting, in the vicinity of my hives, a large quantity of the common kind of crocus, single blue hepatica, heleborus niger, and tussilago petasites, all of which flower very early and are rich in honey and farina: *salvia nemorosa* (of Dr. Smith), which flowers very early in June, and lasts all the summer, is in an extraordinary manner sought after by the bees, and when room is not an object, twenty or thirty square yards of it may be grown with advantage: *origanum humile*, *origanum rubescens* (of Haworth), and *mignonette* may also be grown; cultivation beyond this, exclusively for bees, I believe answers very little purpose.

Dr. Bevan says:—"To those who, residing in towns, may consider it indispensable to the success of an apiary, that it should be in the immediate vicinity of good pasturage, and be thereby deterred from benefitting and amusing themselves by keeping bees; it may be satisfactory to learn, that the apiary of the celebrated Bonner was situated in a garret, in the centre of Glasgow, where it flourished for several years, and furnished him with the means of making many interesting and valuable observations which he gave to the world about thirty years ago."

My own experience also proves the truth of the above statement: residing myself for four years in the centre of a large town, in a house without a garden, I kept two stocks of bees in my study, in glass, and four or five others in the improved cottage hive upon the roof of my house, and I am not aware that they have ever done better, or afforded me a larger quantity of honey in any other situation.

The following are wholesome and useful hints:—

The best time to establish an apiary, is from the middle of February to the middle of March.

The young apiarian should, in buying his stock, take the opinion of an experienced person, weight being no criterion of value, because old hives are frequently loaded with pollen or farina, which has been accumulating perhaps for years.

Never buy old hives if you can buy swarms of the preceding year.

When young swarms are purchased, they should be placed where they are to remain, the very evening after they have swarmed.

It matters not whether hives are straw or wood, except as to price.

Straw hives are recommended to be made the shape of a half-bushel measure; nine inches deep, twelve inches across, and flat on the top, with a hole four inches round; this to be covered with a piece of straw, an inch larger all

\* This fact, though it has been denied by those who profess to have had much experience in the management of bees, is known to every novice in Apian science, for he does not suffer much time to pass, after having purchased a swarm of bees, without endeavouring to ascertain how much honey they have collected, and finds the difficulty of separating the hive from the board upon which it was placed.

round than the aperture. This, in favourable seasons, can be removed, and a small hive placed on the top.

Small hives, for the top, may be glass, or wood, or straw. If glass, it is to be covered to exclude the light, and in severe weather there should be warmth in the covering.

The very best covering to protect a hive from wet is a milk-pan reversed.

When this small hive is filled, it can be removed and replaced with another. It is first lifted, and the empty hive which has a hole on the top is put between the full hive and the stock-hive, and ultimately remove the full hive altogether.

Wear thick worsted gloves in preference to leather ones in all operations among bees. If they attempt to sting they cannot withdraw it from leather, and many thus perish. Quietness, coolness, and confidence, are the best protection. To breathe on them is highly irritating and offensive.

When the small hive is lifted, and an empty one placed between that and the stock, it should remain some days, until it is presumed the bees have left the top one. It should then be lifted off very gently, and placed within four or six inches of the table or ground, propped up by bricks, or a similar contrivance. A loud humming noise is first heard, and the bees are seen to leave it in a few minutes; but should the queen be in the box, all will be quiet, and the principal hive will appear in confusion. In this case it should be returned to its place a day or two, and then attempted again.

Autumn and spring are the most proper seasons for supplying weak stocks with food. Bees should never be fed in winter.

Let a dish or soup-plate into a piece of flat wood, so that the rim is flush with the board. Fill this with honey, and put pieces of paper on the surface to prevent the bees sinking into it. It may be placed under the hive at sunset, and removed at sunrise.

Moths are the greatest enemies to bees, except their possessors, who often do as much mischief by tormenting and mismanaging them as vermin do. In the caterpillar state the moth will sometimes attack and destroy a whole hive. The best preventive is the frequent cleansing of the hive floors, for the female generally deposits her eggs between the hive and the board on which it stands, or in the dust that accumulates at the bottom.

The blue titmouse destroys a great many. One will kill and afterwards eat the bags of a dozen at a time: destroy their nests in breeding time.

Bees should be hived directly they are swarmed, and not be left till the evening, as is too much the practice.

Never put sticks across the inside of a hive; it has been found troublesome, useless, and is discontinued by all good managers.

By attention to the above hints, young apiarists may manage a few hives without much difficulty; but the *Apiarian's Guide* will be found useful, as it contains some observations on Mr. Nutt's plan for keeping bees, and a good deal of detail, interesting to those who have a fancy for the sweets. The author gives, among other things, some odd recipes for the cure of stings, but some are infinitely worse than the disease itself; for instance, holding a piece of live coal or hot iron to the part affected for five minutes is no pleasant change from the sting itself. We know that when a wasp stings, it is an almost instantaneous remedy to rub the place with the blue bag used in the laundry. Whether this is the effect of the indigo or the chalk, is immaterial; but certain it is, that if applied instantly while the wound is open enough to receive the blue, it seems a complete antidote to the poison; but when it is much swelled, and the wound is closed, you cannot force the blue into it, and of course it takes no effect.

#### STRAWBERRY PLANTING.

It is customary to plant fresh-rooted, or, to speak more correctly, half-rooted, new runners, in July, or early in August; and the consequence is, that if the soil be at all binding, and the season dry, about five-sixths of the plants perish, as they fail to take to the ground; but the nurseryman is again resorted to; fresh stocks are purchased, and this season of *profit and loss* continues to be recommended. *September* is the most propitious to autumnal planting; the ground continues warm, open, and pulverizable, in consequence of the usual rains of the period. Sufficient stimulus remains to excite the roots, and enable them to establish the plants in the soil. But although July and August are bad months for planting, they are in every way favourable to the preparation of the runners. The soil, therefore, in the proximity of healthy and *proved* good fruiters, should be slightly moved, enriched with a little leafy compost; and each perfect runner-plant should be pegged down by its string, or made steady by a flint stone laid upon it: thus, the offsets will protrude fine stocky roots in a short time, and will be fit to move in September, with every prospect of success.

So much for autumnal plantings; but our present attention is called to the operations of the advancing year; and hereupon our experience is conclusive, that, whatever be the comparative excellence of new plantations, very fine fruit may be depended upon from old roots.

We have gathered good Strawberries from plants which were raised by four cuts of the spade, made at right angles, one on each side of the established plants of three or four years, and transferred, with the whole mass of earth adhering, to holes made in other situations where required. *Fresh soil*, and not fresh roots, is the essential; and this leading fact receives force from another, which has been proved during the course of six years,—namely, that forced Strawberry plants require only shifting in August (into perfectly new compost) to secure successional crops of really fine berries.

Mr. Knight renewed Strawberry beds annually; and where there is spare ground, superior fruit will thus be always at command; but the excellence of one plan by no means vilifies and degrades every other mode of proceeding. We assert, from assured observation, that in a garden of large extent, managed by a man of great experience (twenty years, at least, on the same spot), and whose heart, as well as head, is in its right place, as regards his profession, Strawberries of fine quality are produced in such abundance, that they are gathered, like flowers, by the stalk, from beds which have remained undisturbed for seven or more years.

The *first preparation of the soil* is of the greatest consequence; the staple should be an unctuous free loam, that never binds. It should be taken out two feet deep, enriched with fresh turf and manure at the bottom, to the extent of six inches; and the returned soil should be mellowed with linings of reduced vegetable earth. Coal ashes continually added as top dress will lighten the soil, and encourage the collar-roots.

Now, to meet the views of the advocates for annual plantings, so far as fact and theory warrant, we will suggest a method of planting in which we never remember to have failed. Let a plot of the best soil be marked out, of extent sufficient to form three or four fair-sized beds, including four twelve inch alleys. After trench-digging, &c., one of the beds as above, let the earth settle during a fortnight. Then plant this one bed with the best and most approved runner plants of July, four rows, from twelve to eighteen inches asunder will form a bed, the plants standing six inches from each other. The work should be completed before April; and water should be given freely; first, to puddle in and fix the roots, and subsequently when the soil appears dry. See that the bed remains full by supplying any plant that may fail; and if any blossoms appear, pinch them out, *not suffering a single fruit to form on any plant*; this finishes the first year's operations. In the second year prepare and plant the second bed in the same way, either in September or March, as the case may be. But the second year let every

blossom remain on the plants of the first bed. Another autumn or spring will see the third bed prepared and planted; and it is to be treated as the two former. No. 1 is in the fourth year to be obliterated immediately after the crop, and if a fourth bed be comprised in the plan, a vegetable crop can be placed upon No. 1; this will abstract from the soil all the fecal exudations of the Strawberries, and prepare the site for a second course. Four beds will form a complete plot, three being always under Strawberries, and one under a vegetable adjunct, and purifier.

#### LIQUID MANURE FOR PLANTS IN POTS.

I HAVE a seedling plum-stock, growing in a small pot, and attained the height of 9 ft. 7 in. in a single season; which is, I believe, a much greater height than any seedling tree of that species was ever seen to attain in the open soil. But the quantity of earth which a small pot contains soon becomes exhausted relatively to one kind of plant, though it may be still fertile relatively to others; and the size of the pot cannot be changed sufficiently often to remedy this loss of fertility; and if it were ever so frequently changed, the mass of mould which each successive emission of roots would enclose must remain the same. Manure can therefore probably be most beneficially given in a purely liquid state; and the quantity which trees growing in pots have thus taken under my care, without any injury and with the greatest good effect, has so much exceeded every expectation I had formed, that I am induced to communicate the particulars and the result of my experience.

I for some years appropriated a forcing-house at Downton to the purposes of experiment solely upon fruit trees, which, as I had frequent occasion to change the subjects upon which I had to operate, were confined in pots. These were at first supplied with water, in which about one-tenth by measure of the dung of pigeons or domestic poultry had been infused, and the quantity of these substances (generally the latter) was increased from one-tenth to a fourth. The water, after standing forty-eight hours, acquired a colour considerably deeper than that of porter, and in this state was drawn off clear, and employed to feed trees of vine, the mulberry, peach, and other plants. A second quantity of water was then applied, and afterwards used in the same manner; when the manure was changed, and the same process repeated. The vine and mulberry tree, being gross feeders, were not likely to be soon injured by this treatment, but I expected the peach tree, which is frequently injured by excess of manure in a solid state, to

give early indications of being over-fed. Contrary, however, to my expectations, the peach tree maintained, at the end of two years, the most healthy and luxuriant appearance imaginable, and produced fruit in the last season in greater perfection than I had ever previously been able to obtain it. Some seedling plants had then acquired, at eighteen months old (though the whole of their roots had been confined to half a square foot of mould), more than 11 ft. in height, with numerous branches, and afforded a most abundant and vigorous bloom, which set remarkably well; and those trees which had been most abundantly supplied with manure displayed the greatest degree of health and luxuriance. A single orange tree was subjected to the same mode of treatment, and grew with equal comparative vigour; and appeared to be as much benefitted by abundant food as even the vine and mulberry tree.

An opinion generally, though I think somewhat erroneously, prevails, that many plants, particularly the different species and varieties of heaths, require a very poor soil in pots: but these might, I conceive, with propriety be said to require a peculiar soil; for I have never seen the common species of this genus spring with so much luxuriance as from a deep bed of vegetable mould, which had been recently very thickly covered with the ashes of a preceding crop of heaths, and other plants that had been burned upon it; and I believe, if the branches and leaves of the common species of heath were placed to decompose in water, and such water were afterwards given to the tender exotic species, that these, how heavily soever the water may be loaded with organisable matter, would be found as little capable of being injured by abundant food as the vine or mulberry tree, though the species of food which would best suit those plants might prove to every species of heath destructive and poisonous.—*Horticultural Transactions*.

#### ON PLANTING SHRUBS IN MASSES.

In the practice of landscape gardening, opinions are almost necessarily of a widely diversified character relative to points of detail, most individuals having their own peculiar views as to the arrangement of those minor objects which constitute the several parts of a garden scene. And it is perhaps well that such is the case; for, otherwise, we might be constantly burdened with that ceaseless uniformity which would disgust rather than please; since, however excellent any particular style may be in itself, it always produces weariness if invariably carried out in precisely the same manner.

The arrangement and grouping of trees and

shrubs may be taken as an illustration of the circumstance to which we refer. Some professors have been strong advocates for the planting of these in beds or clumps, according to their natural relations; and others have so vividly perceived the objectionable nature of this plan, that they have perpetually adopted indiscriminate mixtures, for the sake of obtaining that variety of aspect which so much pleases the eye. A few, again, pressing the latter purpose still further, have practised the planting of single specimens to an extent which seems incompatible with any great and striking effects.

Now, while we by no means consider the collecting of shrubs and trees into families applicable as a general rule to ornamental gardening, inasmuch as irregularity without its beauty, and sameness without unity, would be unavoidably occasioned; there are tribes which may be appropriately grouped, according to their natural affinities, especially when the species have been hybridized into numerous varieties. Rhododendrons, and some other American plants, will exemplify this.

As to those general assemblages of trees and shrubs, in which species of the most different characters are associated, they are unquestionably preferable to any other kind of grouping, provided a due regard be kept to the preservation of some kind of unity and expression. It is mostly considered, among the ordinary planters of gardens, that, if every plant in a group be different from its neighbour, enough has been done in the way of arrangement. This, however, is very erroneous. There ought to be a harmony preserved throughout the whole—a blending and yet a contrast of forms—a variety as to the season for the development of foliage and flowers, so, that there be some interesting object in every part of the group, at almost all periods, and not too many in one place—which requires the utmost experience and knowledge, and forms one of the last attainments of a planter. Mr. Paxton underrates we think most gardener's notions, so far as we have yet followed him through an article in the Magazine of Botany for July, further on there are points better worth notice. He says as he proceeds.

In respect to single specimens, they are admirably fitted for creating striking effects, and exhibiting elegant outlines, if judiciously and rather sparingly employed. On a large lawn, interspersed with groups, or so arranged as to compose a group of themselves, they are especially beautiful. But when a lawn is so thickly studded with them as to leave no broad glades of grass for the eye to rove over and rest upon—particularly if they are not intrinsically ornamented enough to be calculated for

standing out alone, and being viewed from every point—they become extremely displeasing. Nothing, in the whole range of gardening, is more distasteful than a fine lawn dotted all over with isolated specimen plants, and having no large open spaces to give it breadth and repose. If it be on a level, or nearly so the deformity is still greater.

Decidedly the best position for solitary specimens of shrubs is in retired parts of a garden, where nooks or small open plots of grass occur, and where the plants will both be seen to advantage and be in character with the spot.

But we purpose here to speak more immediately of the desirableness of making groups of one species of shrubs, or of several varieties of the same or allied species. In heterogeneous mixtures, there is manifestly at all times a scantiness of inflorescence, only here and there a shrub being in bloom at the same period. Single plants, also, are alike deficient in that amplitude of blossom which is requisite to the production of a very grand or imposing display.

An allusion to the modern practice of filling the beds of the flower-garden, will show the kind of characteristic which we wish to see more frequently imparted to the clumps of shrubs which are used in diversifying the lawn. This style has, indeed, been adopted in some places, though by no means so commonly as it ought to be, and only to a limited extent as respects the objects so grouped.

Masses of *Rhododendrons* are far from being rare in pleasure-ground borders; yet they are not so usual in detached beds, which are more interesting. *Azaleas*, too, are sometimes met with in the like circumstances. And to say that both of these tribes have a most glowing aspect, when thus brought together, and presenting a sheet of varied blossom, is but cold praise. A large bed of the best varieties of *Azalea* is among the finest things in creation, when blooming freely.

*Kalmia latifolia* is another excellent plant for growing in a mass, since, in good seasons, the entire surface of each specimen will be clothed with flowers, and thus a robe of delicate, wax-like bloom will be spread over the whole bed for a considerable period.

For the purity and snowy whiteness of its numberless blossoms, and the compactness of its habitude, the *Leucothoe* (*Andromeda*) *floribunda* is likewise a valuable thing for small beds. Amongst a number of darker and warmer-coloured masses, it would give a lovely relief; and, even by itself, its own dark green foliage, and the bright verdure of a lawn, would sufficiently throw out the whiteness of its inflorescence.

Several heaths, and various American plants

which do not occasion much display when planted singly in the borders, acquire an astonishing degree of interest if placed in masses, so that the specimens can run into each other. Such is the power of the sun on most species of this class during the hot summer months, that they can seldom gain sufficient strength to resist his prejudicial influence when they are standing alone. But as soon as they are collected into masses, they speedily unite their branches so efficiently that no amount of drought or solar heat seems afterward to harm them.

For a proof of this fact, from analogy, which any one may examine and test by an hour's observation, we would refer to moorland tracts or rocky hills where peat abounds, but where the heath and other plants do not altogether cover the ground. Patches of different heaths, or of the pretty *Vaccinium* or *Oryzococos*, from two or four feet in diameter, may be seen flourishing in the greatest luxuriance; while smaller pieces, composed of only one or two plants, have been withering and dying during the past month. Obviously, the grouping of the specimens has protected them from the injuries of exposure, and given them their peculiarly healthy and beautiful appearance.

Beds of roses are so universal, that we need but just glance at them with the view of establishing the propriety of grouping flowering shrubs. Where the situation will admit of it, and a higher refinement is not desired, a few clumps of Lilacs would make a glorious feature in a pleasure-garden, garlanded with their handsome flowers in the month of May. A bed of dwarf honeysuckles, also, pruned into bushes, would be an enchanting object. Masses of fuchsias, moreover, will soon, we trust, be as common as gardens themselves and the love of flowers; for they are some of the most elegant of our summer embellishments, and almost as hardy as the *hydrangea*. The latter plant is a splendid thing for grouping; its large heads of flowers being so well fitted for giving breadth of effect.

Probably one of the showiest of all plants for placing in masses, and one which is so peculiarly attractive on account of the earliness of its flowers, is the *Ribes sanguineum*. We were vividly reminded of this on witnessing a quantity of it planted as a hedge in one of our largest provincial nurseries. Thus treated, its showiness was perfectly dazzling, and we were compelled to acknowledge that we never before had a true conception of its real magnificence. Planted in a group of six or eight yards in breadth, on an ample lawn, we should think it would be transcendently rich.

A few species of *Spiræa*, and *S. ariaefolia* in particular, would make exceedingly striking

masses on a lawn. *Cydonia japonica* and its pale-flowered variety might likewise be effective, although they hardly send enough of their flowers to the surface to adapt them for groups, without a good deal of pruning.

Many more shrubs of an ornamental character, and easily procured, might here be pointed out as appropriate for the end under notice. But we have indicated a sufficient number to serve as an explanation of our object, and as a guide to the rest. The main idea that we have sought to enforce is, that the tameness of lawns in general, and the want of occasional bursts of splendour among the groups scattered over them, may be met by introducing masses—more or less ample, according to the natural size of the plants, and the extent of the place—of one species of ornamental shrub, or several varieties of the same or similar species. A brilliancy and impressiveness, superior to anything attainable by other means, would thus be imparted.

From these remarks something may be gleaned by the tyro for whose especial use we quote, but there is little to be learned by the man who has made himself at all acquainted with effect.

#### EXPERIMENTS ON THE CAMELLIA.

WE have on former occasions offered some remarks on the essential principles connected with the *acclimatising* these noble plants, with a view to their adoption as ornaments to the lawns, the shrubberies, and boundary walls; since then we have had an opportunity of proving the subject by a practical test. In pursuance of this desirable object, last autumn we placed ten plants of Camellias in an open border at the foot of a wall, having a due south aspect, and we take the present opportunity of giving the result, so far as we have gone.

The border was prepared about a month previous to planting, by throwing together equal quantities of loam, leaf-mould, and turfy peat, forming altogether a stratum of about eighteen inches in depth, and twice that number in width; the bottom being well drained with pieces of stone and old bricks, and after having well mixed the component soils, the bed was allowed three or four weeks to settle. The plants selected had hitherto been growing in pots, with the treatment usual to them in such circumstances; they were *Pomponia*, *Althæa-flora*, *Insignis*, all of them being about two feet high, with a tolerable share of bloom-buds already set upon them. Soon after being turned out they were nailed to the wall, and in this state left, without further protection, until the following January, when, being aware of the injurious effects likely to ensue from premature

excitement, the plants were covered with thin canvass or bunting, not with any intention to preserve them from frost or cold, for the material was *very thin*, but to *screen them from the sun*; and here we may remark the southern aspect was not chosen as being favourable to the desired end, but was used for the purpose, simply because the wall must be covered, so that, in fact, it was rather a selection of the plants for the wall, than of the wall for the plants, and this aspect eventually proved the only difficulty we had to contend with. During the succeeding two months the plants were several times subjected to severe frost, with only a slight additional covering occasionally at night (which we have since thought unnecessary), still they retained their foliage and flower-buds, only two of the whole number falling off. The screen was continued before them until the flowers began to expand, which, from the constant shade afforded, was deferred till the middle of April, and then it was, the real and only difficulty presented itself. The sun having great power at that time, forced the flowers open quickly, and of course it was out of the question to continue the shading longer, and thus hide their beauties; but so soon as the full power of the solar heat fell on them, the flowers opened, and were scorched up directly, scarcely one lasting in any thing like perfection more than a day: this was vexatious, and there appeared to be no remedy but in a change of aspect, for it was not possible to protect them from this scorching influence without obstructing the view of the flowers; but had they been in any other situation with respect to the sun, it is easily seen the direct rays would have been broken, and the intensity consequently dissipated and softened down to a vivifying warmth, and therefore, in all future operations of the kind, we shall prefer a situation that receives but little sunshine, indeed, we think the less the better; for without its effects, the necessity for protection will be done away with, except in instances of the opposite extreme in the temperature of the air. The plants are now making a healthy growth of a medium size.

Thus we add another instance of the assimilation of the period of growth to our seasons being necessary to the acclimatising exotics: the great obstacle we had to surmount was the natural excitability of the plants, which, had they not been shaded in the early part of the season, would have induced them to open their buds full a month sooner, and as the new wood follows immediately after the flowers, in all probability it would have appeared, and directly been cut off by the frost. We are persuaded henceforth that this assimilation is the fundamental principal to be observed, and that the idea of imparting a more robust character to



the plant by means of seed raised in this country, is erroneous, the object gained by this process being referred more correctly to the adaptation of the growth to the season.

The foregoing is abridged from a paper by the editor of the *Florists' Journal*, but it reminds us of twenty instances of this very beautiful plant being grown out of doors. At the Mile-end Nursery we have seen plants six or eight feet high, that had been years out of doors without the slightest indication of injury, and these were away from any wall. The most they had in the way of protection in the hardest winter was a mat occasionally thrown over the top of them.



ÆSCHYNANTHUS PARASITICA.

This belongs to a very limited genera; the only varieties known in English collections, up to a recent period, being *Æ. grandiflora*, *Æ. Roxburghii*, and *Ramosissimus*. The first is recorded to bloom in August, the second in July, and the third in June. It is a showy orchideous plant, with scarlet flowers coming in abundance at the end of new shoots. But we think there is little reliance on the season of blooming. They are all from the East Indies, and require the same treatment as the great majority of orchideous plants. They will grow in moss and chopped peat as on a log of wood, and should be in all collections. The subject before us is useless to any but those who have a stove in which to grow it.

#### COCHINEAL PLANTATION, ALGIERS.

THE Cochineal Cactus has been frequently exhibited, and it is not uncommon to see them with the insect, which is, when dried, the Cochineal of commerce, living and propagating upon it. It is still called a Cactus by many,

but in the fashionable vice of dividing and sub-dividing genera this takes the name of *Opuntia*. The French are not in quite so much hurry in these matters, and, therefore, M. Simounet, in a paper forwarded to the *Journal de Pharm.*, calls the plant *Cactus Cochinitifera*. He seems to have established a plantation of this remarkable plant, for the purpose of breeding Cochineal in Algiers; and chiefly from a clever detail of considerable length we learn the particulars sufficiently to give the following abridged account. It seems that France pays yearly, to strangers, a tribute of nine or ten millions (of francs) for the Cochineal which she uses. Struck with this important consideration, M. Simounet wished to turn to profitable account, as regards the national interest, the knowledge which a year's residence in the neighbourhood of Valence, in Spain, had enabled him to acquire, with reference to the education and propagation of the Cochineal.

At his suggestion, several agriculturists of Algiers, engaged in the cultivation of the insect, and a model cochineal plantation (*nopalerie*) was established in the experimental garden at Algiers, through the exertions of M. Hardy, its director.

The following details are from a communication received from M. Simounet.

#### DESCRIPTION OF THE COCHINEAL.

**1. Physical Characters of the Male Insect.**—The male Cochineal differs entirely from the female. It is a dipterous insect, having two transparent wings; six feet, each terminated by a small, very sharp claw; two antennæ, composed of nine articulations, covered with a silky down, and six black and immoveable eyes. Its red body is covered with a white dust, its abdomen is terminated by two white silky hairs. The length from the head to the extremity of the abdomen is one millimetre; the size is that of an oblong louse.

The period of maturity of the male Cochineal is not the same as that of the female. Like the latter, he fixes himself on the cactus, but his body is not equally developed. Instead of enlarging, he becomes covered with down, at the expense of which down, after the lapse of a month and a half, a cocoon is formed. The two hairs which issue from his posterior extremity serve to keep the cocoon always open. At the fecundating period, a month and a half after his birth, he issues backwards from his envelope, and flies from one female to another; afterwards he dies and disappears.

**2. Physical Characters of the Female Cochineal.**—The female Cochineal presents the aspect of an elliptical pea. Its body is composed of an indeterminate number of rings, giving

it the appearance of a curled-up annulede. Its color is blackish.

The body is covered with a white pulverulent down, which, being impermeable by water, serves as a defence against the inclemency of the seasons.

The feet are six in number, having two articulations, and each terminated by a pointed claw.

There are two cylindrical antennæ, composed of three articulations, of which the last is rather the longest.

Between the two upper feet are situated the organs of nutrition. These organs are composed of a small gland, and a canal of the diameter of a hair, and of a red colour, showing that the plant on which it feeds is introduced into the cellular system.

The Cochineal is really viviparous, and survives the production of its little family. The number brought forth, according to my observations, is not 632,777, as stated by a Spanish author, but about 300.

The female Cochineal is that to which we shall direct especial attention here, as she alone forms the article of commerce, and the substance so much prized for its colouring properties. It is from the female insect that carmine and the different lakes are prepared. She certainly affords one of the most valuable colours employed in the art of dyeing. On this account the insects merit a greater degree of attention than has hitherto been devoted to them.

#### PROPAGATION OF THE COCHINEAL.

*Choice of the Cactus.*—The cochineal does not thrive well, excepting on the cactus cochinillifera, and there are several reasons for this. In the first place, the hairy surface of this plant facilitates the peregrinations of the young insects. If there should happen to be much wind, not only do the feet of the insects catch in these small hairs, but the two surfaces adhere at a number of points, and its position is thus retained. It has been proved that the Cacti of Africa may be employed for the propagation of Cochineal, but less advantageously than the other, as the least wind dislodges the insect.—Moreover, the cactus cochinillifera produces a fruit which has always a purple colour; and, according to Pelletier's analysis, this plant contains the colouring matter of carmine, and of the insect which affords this valuable product.

*Arrangements of a Cactus Plantation.*—In establishing this, it is desirable to select a spot of ground sheltered, as much as possible, from the north winds; the ground should be laid out in furrows, and well freed from weeds. Slips of the Cactus having been procured, they should be exposed to the air for a few days, so

that the part at which they have been cut may become dry. The season best adapted for making the plantation is summer. The slips should be planted in rows, at a distance of 39 inches from each other; the rows should be two yards apart, for convenience in collecting the Cochineal. The plants should be watered every fifteen days in summer. The ground should be turned up once a year with the mattock or plough. The fruit of the plants should be taken off as it appears, so that the plants themselves may retain the properties, of which they would otherwise be exhausted by the fruit. The plants should not be allowed to grow more than about sixty inches in height, the branches being spread out in the form of a fan. The plants, having attained the proper growth, may now be employed for the propagation of the Cochineal.

*Method of placing the Cochineal on the Cactus.*—In Spain they prepare for this purpose small cylindrical cases about two inches long, and about two thirds of an inch in diameter, open at one end. A palm leaf is used for making these cases, the net-work of the leaf allowing a sufficient opening for the insect to pass through. These cases are intended to contain a dozen of the female insects; fifty such cases are attached to a Cactus by means of small thorns obtained from the Cactus ferax; metallic points for fixing them must be avoided, as the wounds occasioned by them would injure the plants. The period at which the Cochineal is about to produce its young is known from the appearance of a small drop of a coloured substance at the posterior part of the insect. This is also the period for the collection of the insect.

*Method of collecting the Cochineal.*—In the first place, by means of a knife made of reed, the insects intended for reproduction must be carefully detached, and placed in the small cases already described, ready to be fixed on the plants after they have been properly washed and brushed. This first operation being concluded, cloths are to be spread on the ground under the plants, and, with a brush made from the palm, all the insects which remain are brushed off; this constitutes the available product. Three gatherings may be made in the year; in May, July, and October. After each collection it is very important to clean the plants with brushes, and even to wash them, so as to remove all the white matter deposited by the previous crop of Cochineal. With careful attention to these directions, the plants may be made to serve for the propagation of the insect for five or six years.

*Method of killing the Cochineal.*—Several methods have been adopted for killing the insect. In Spain boiling water is used; mere

exposure to the sun has been recommended, also the placing the insects on plates in an oven. But all these methods are imperfect, as they sensibly alter the quality of the colouring matter. I recommend the following method, as being, under all circumstances, the best and most convenient:—It consists in exposing the insects to the heat of a water-bath, and drying them at a high temperature without exposure to light. The quality of the cochineal obtained in this way was equal to that most esteemed in commerce.

*Enemies to the Cochineal.*—The enemies to the Cochineal are, first, a small snail which fixes itself on the Cactus, and which is easily removed on examining the plants every eight days. Another of these enemies is the *cocinelle* (lady cow), called by the Spaniards *pintillos*. This insect produces great ravages. The means for effecting its destruction occasions the greatest amount of trouble connected with plantation. The eggs which produce the larvæ of this insect (and it is in the state of larvæ that it is so destructive to the cochineal), are generally found at the base of the cactus. There is another insect which I have only observed in Africa, and which requires to be especially guarded against; it is the *forbicina*. These get into the little cases in which the female cochineal, intended to stock the plants, are placed, and they devour the cochineal. This evil may be obviated by closing the openings to the cases with muslin after introducing the cochineal.

#### ON THE GENUS CACTUS.

PART OF A LECTURE BY PROFESSOR JOHNSON.

IN the Genus Cactus the number of species described exceeds two hundred, much divided in appearance and form, and characterised into several genera more or less by different botanists. However useful this may be with an extensive genus, in this case it can be but of little use to the botanist, with the natural order of cactacea. The divisions in this instance may be compared to the splitting of straws, by means of which a few paltry geniuses seek to preserve their names from that oblivion into which they would otherwise have fallen. Leaves are present in a very few species, but as scales, or little projecting points, as clusters or spines, which are the abortive leaves. Their geographical distribution is well marked, being found as far as thirty degrees south, and some few as high as forty degrees north; they are incapable of standing frost, as their juices are soon frozen by a slight cold, and thus their organization is injured. Notwithstanding the singular difference which they present, they were associated with the natural order Gros-

sutaria, to which the genus ribes, including the currant and gooseberry, belongs. Now they present many very curious features of analogy; and there are, perhaps, no reasons why they should be disconnected with this order. We may easily imagine the gooseberry in its dilated form if the spines were expanded to resemble the cacti, and these, if the cellular tissue were removed, to resemble the gooseberry. It would appear that these different forms are produced only by the difference of climate in which they grow; the gooseberry growing in a cold one causing the developement of the leaves, and the Cacti growing in a warm climate the nutriment, which is designed for leaves, going to the stem. There is also a great resemblance in the fruit of both varieties, which is always inferior, or beneath the flower; they are in both cases one celled, contain numerous seeds, and are very succulent. The edible fruit of the Cacti is much like that of the gooseberry, and in fact differs from it only in the absence of acidity. Where, too, the Cactus fails, the gooseberry comes in and flourishes as if it were intended by nature to remedy the deficiency. The watery character of the juice of the Cacti distinguishes them from the euphorbia, which are generally, though not always, milky. The former are, however, always destitute of acrid principles, and sweet and wholesome; they are all innocuous, and the fruits are wholesome, for although they would be insipid in Enrope, in the sultry climate they are good and palatable. The cattle resort to the stems, and tearing off the prickles, feed upon the luscious pulps. Besides being food for man and cattle, almost the only other economical purpose is their use in the production of cochineal, which insects feed upon the opunchia or Indian fig, though, why this plant is so called it is hard to say, except from the imaginary resemblance of its fruits to that of a fig. The juice of two species of this plant is red, and in Mexico many of these plants are cultivated in order to rear these insects upon. Cochineal is well known in commerce, and as the substance from which carmine is obtained; and although this insect will feed on many other species of Cacti, its colour deteriorates if not fed upon those plants which have this juice. Several experiments have been made to ascertain if it were possible to obtain the colour direct from the juice, without the trouble of rearing the insect, but this was very inferior; so that it appears some process of elaboration goes on in the insect which communicates a superiority of colour. Cacti are much sought after for rare forms, and many of these are the most grotesque; in fact, they are now so common, that there is scarcely a house in which any attention is paid to the cultivation of flowers where some species are

not found. The most common varieties found are the *Cactus speciosus*, or *C. speciosissimus*, or some which are raised from these. Horticultural science has already produced many splendid varieties of *C. speciosissimus*, but much more remains to be done, and he suggested trying experiments between *ceres speciosissimus* and *epiphyllum*. One of the most magnificent flowers which had been introduced into this country for one hundred and fifty years, the *Cactus grandiflorus*, or night blowing *ceres*, had been singularly neglected. The flower was most magnificent, being often a foot in diameter, and under careful treatment was free, its production from seed being pretty sure, as the seed ripened well. Now, there was little doubt but that pretty varieties might be obtained from it, and more advantageous to its possessors in the time of flowering, which was now said to be at midnight, although it in reality commenced at about six o'clock. It would be worth trying experiments between this and *C. speciosissimus*, both belonging to the same sub-genus. Whether, also, an union might not be made with the *melo-cacti*, by placing on them the larger flowers of *speciosissimus* or *opuntia*; or whether physical differences of growth would prevent it; but so much had been effected by man, that it was advisable to try even where the physical differences might be great. The *Cacti* display curious evidence that their position has not been altered since the creation of organic beings on the surface which they inhabit, a most striking circumstance of interest both to the student and the geologist. They are wholly confined to the meridianal parts of America, from thirty degrees S. to forty degrees N. latitude; and they there occupy the same position as the succulent *euphorbias* in Africa and Asia; and they negatively seem to prove that ever since their production the Atlantic Ocean was a barrier between them. We have said that they are wholly confined to America, but there are some exceptions, as four or five species are found in the Canaries and Valdiva Islands, on the coasts of Africa, and the *opuntia* is also found on the shores of the south of Europe. It is cultivated in the island of Sicily, where it is the first that is planted in the fields of lava, for wherever a fissure or breakage is seen in the rocks, there they plant one; and the roots pushing break it further open, and thus mechanically aids in the formation of future soil. Although these have been considered by some as natives of the South of Europe, growing upon a sandy soil, it is yet far more probable, that as they are exclusively natives of the West Indian Islands and the continent of Africa, seeds of these have been accidentally wafted to these positions from the opposite shores, the same as the

seeds seen by Columbus drifting to the coast of America, and which confirmed him in the existence of that continent, which his fondest hopes so soon after were realised in the discovery of.

A few remarks may in conclusion be offered on the adaptation of succulent plants to the purposes of nature. The pores of these only exist in a rudimentary state to open or shut, according as nature requires them. They are constantly closed that portion of the year when the season is dry, and are open only when the atmosphere is moist. By this contrivance the vital fluids are retained in the stem, which consolidates. They were thus made by Providence to supply food and drink to many species in barren and tropical regions, both to man and his flocks and herds. The fountain in the desert, nor the manna in the wilderness, were not greater miracles than the formation of these plants, and their adaptation to the circumstances in which they were placed. But thousands of other similar objects of Providential care are daily visible to those who study nature, affording repeated proofs that nothing was made in vain. We can only, perhaps, immediately recognise these plants as useful objects in the preservation or nutriment of animal life, but there were perhaps others which were unknown to man, and there was not a plant in the most wild or inhospitable part of Africa where man did not exist, but for some general good. Possibly, the *euphorbias* and *aloes* were laying the foundation of the soil which ages hence would be the scene of human life and ingenuity.

#### THE SCIENCE OF HYBRIDIZING EXPLAINED.

As, after our practical remarks on this subject, we are prepared to find other writers take up the science, and expatiate upon its merits, it would be only fair to let our readers see what has been written long since; not that it will show that we were indebted to any author for our practice, for we hardly knew any thing had been written in its favour, although enough had been said and written against it. With Mr. Heywood's permission we offer a portion of his volume on the Causes of Fruitfulness and Barrenness of Plants and Trees, published in 1834, for the same ideas will be, indeed have been already, published, as though they were original emanations of the present age.

**Q.** What are the peculiar uses of the different parts of a flower, and what object do they concur in establishing?

**A.** The use of the calyx appears to be to envelope and protect the blossom during its infancy, or whilst it is in the bud, and to support it when expanded; and with some plants to encompass and sustain the seed-vessels or

fruit, during and after the decay of the petals, and until they become innured to the climate, or until the season is sufficiently advanced and the weather sufficiently warm. The corolla, petals, or blossom leaves, do not appear to be of any other use than that of protecting the stamens and anthers, and possibly of secreting and securing the contents of the nectarium; but no doubt their beautiful colours are also designed to allure and attract the notice of insects to the stores of the nectarium, which they surround.

The stamens are formed to support the anthers, and with them to secrete and furnish the pollen, or that substance which, in the form of a powder or light dust, is the medium by which the living principle is conveyed to the seeds; which powder, on examination by the microscope, appears to consist of globules, or eggs each containing the rudiments of a plant. It is supposed that these eggs, being placed on the stigma of the pistil, and exposed to the influence of the sun, are burst or hatched, and that the living principle being taken in by the stigma, which is furnished with little mouths for the purpose, is by them conveyed down through the tubes in the pistil, into the seeds, which are arranged ready to receive it in their appropriate vessels; and that thus the living principle is given to the seeds. This is not only probable, but we know, by actual demonstration, that unless some of the pollen or powder be brought in contact with, and attached to, the summit of the pistil, the seeds will never acquire the living or vegetative principle, nor attain maturity. It has also been demonstrated, that it is by the means of the pollen that the varieties in the plants raised from the seeds of the same plant, are chiefly produced; and the law of nature seems to be, that a plant shall alike partake of the characteristics, formation, and qualities, of the plant and blossom which produced the seed, and also of that which produced the pollen; much in the same manner and degree that a young animal partakes of the colour, form, and nature, of both father and mother. The pistil, as before observed, is a tube, or an accumulation of tubes, and forms the medium or channel through which the living principle, or rudiment of the plant, is conveyed to the seeds; and it appears formed for this use only; for as soon as its office is performed, it withers and dies. By what motion or impulse the living principle is taken in and conveyed by the pistil to the seeds, may be difficult to ascertain; but the crowns, summits, or ends of these tubes are thus described by Dr. Hill:—"The stigma, or head of the style, which is the extreme part, or termination of the pith of the plant, viewed with the microscope, appears to be covered with pro-

minent tubercles, and the centres of those tubercles open, and form the mouths of so many tubes; these mouths are wide enough to admit with ease one of the minute rudiments of the plant, lodged in each egg or grain of the pollen." The lips of the mouths attach and retain the pollen, or eggs, whenever, or by whatever means, they are brought in contact with them; and being so attached, they are held and exposed to the influence of the sun, by which they are burst, or hatched, and the living principle is then received by the mouths, and conveyed by the tubes of the pistil to the seeds. It must be observed, however, that the pistil and seed-vessels, and the anthers with the pollen, are not always united in one blossom; but in some kinds of plants the pistil and the seed-vessels, or fruit, form a separate and distinct blossom; and sometimes those parts exist without petals or flower leaves.

The nectar, or sweet liquor, secreted by the nectarium, appears to be formed for, and appropriated to, no other purpose than food for insects, and its perfume is diffused to attract them; in this respect it is calculated to produce the most important effects; for a plant being stationary, and it being absolutely necessary, in order to enable it to propagate its species, that the pollen or farina be brought in contact with the summit of the pistil, the means must be provided for effecting this conjunction. In these provisions of nature we see displayed a benevolence and delicacy of design, and such beauty and perfection of order and arrangement, as cannot be equalled by art, nor is excelled in any other part of the grand system of nature. We may consider the nectarium, then, as formed to secrete and furnish food for insects, particularly for bees. These receptacles, or reservoirs of food, are placed at the foot or base, of the stamens that bear the anthers, and of the pistil, and the whole are enclosed by the petals, so that, to come at their food, the insects must pass over and between those parts; in so doing they brush the pollen from off the anthers upon the pistils, or gather the pollen about their heads and legs, which are covered with feathers or bristles in every respect suited to the purpose, and with these they convey it from the anthers to the pistil, either of the same blossoms, or carry it from one plant to another, when separate and at a distance. In this admirable arrangement we have a further instance of certain laws of nature being established for rendering animals and vegetables dependent upon each other; for thus plants are made to sustain insects, whilst insects in return are made needful and important agents to plants in the propagation of their species.

Q. How is this knowledge to be applied to any beneficial purpose?

A. It enables us to take upon ourselves and perform the office of the bee ; and thus, either to produce, or to prevent, the formation of varieties. If we are desirous of producing a particular variety, we may collect the pollen of such particular blossom or plant as we may choose, and convey it to any other blossom that may be selected ; as the seed produced by such conjunction is made to partake of the characteristics of both the blossoms, and of the other parts of the parent plants, and to combine, in a certain degree, the prominent features and properties of each : we may, by a proper selection and paring, direct and promote the production of such varieties as we are desirous to obtain ; and by preventing the conjunction of different varieties, or an admixture of one species with another, we may continue any particular species in its original characteristics and properties.

Q. Can you, by thus selecting and combining two blossoms, produce new flowers and fruits ?

A. Yes, what may properly be called new fruits and flowers ; but we cannot produce a new genus of plants ; varieties of the same genus in colour, size, and general qualities, may be thus obtained at pleasure ; and in some plants, in number beyond calculation, for all plants are not alike in this respect ; in many, it is difficult to produce any variety ; in some, perhaps, impossible.

Q. Will not one genus of plants blend with another ?

A. Not in a general way ; mules or hybrids are sometimes produced, but this may be considered as a sport of nature ; it is a thing which seldom occurs.

Q. Does the production of all the varieties and changes in the form and qualities of plants entirely depend upon the connexion of two or more blossoms of different plants ?

A. Not exactly so ; the quantity and quality of the food, and the nature of the climate, have, no doubt, great influence in determining the constitution and qualities of plants ; but such influential circumstances must exist, and can only be effective at the time of the formation of the seed, or of the conjunction of the farina and pistil's taking place. Seeds engendered by plants whilst they are under the influence of a luxuriant supply of food and a favourable climate, generally produce plants of extended bulk and capacities ; on the other hand, seeds produced by plants that are stinted in their food and depressed in their growth, by an ungenial climate, will produce plants of reduced capacity and bulk. But the plants that are raised from seeds produced in a hot climate will be better enabled to endure that climate, than the same kind raised in a cold

climate, and *vice versa*. Plants raised from seeds propagated in a cold climate, will endure a cold climate much better than the same kinds of plants raised from seeds brought from a warmer climate ; and plants raised from seeds produced by plants under the influence of a luxuriant supply of food, will grow more healthy, and be more fruitful in a rich soil, or with a luxuriant supply of food, than plants raised from seeds produced in a poor soil, and with a limited supply of food ; whilst, on the contrary, plants raised in a poor soil, and with but a scanty supply of food, will grow better in such soil, and prove more healthy and prolific than plants which were raised in a luxuriant soil, and transplanted into a poor one.

Q. When we wish to produce variety, and to obtain plants, fruits, and flowers, partaking of the qualities of two select plants, how are we to proceed ?

A. Suppose, for instance, you have two geraniums, producing differently shaped leaves, and differently coloured blossoms ; or two apple-trees, bearing apples of different sizes, colours, and qualities, and it be desired to produce geraniums of differently shaped leaves, and differently coloured flowers, and apples of different sizes, colours, and qualities, that is, different from either of the two plants or trees which you possess ; the mode of effecting this is, to select a blossom of the plant from which you wish to obtain the seed ; when it is just on the point of opening and exposing the anthers, take a pair of scissors, and, gently forcing open the petals of the blossom intended to bear the seed, cut off the stamens, and remove the anthers, and then leave the blossom thus operated upon for a day or two, or until the petals are quite expanded, and the pistil arrived at a state of maturity ; when it is in this state, select a blossom of the plant with which it is desired to impregnate the prepared female blossom, and when this is in a state of maturity, and in a state to part with its pollen or farina freely, take a small camel's hair pencil, collect the farina on the point, and place it on the stigma or crown of the pistil of the prepared blossom. This operation may be performed, with an equal chance of success, on plants of all descriptions ; but it may be necessary to observe, that, from the time the pistil of the prepared blossom is exposed, until it begins to die away, it will be necessary to guard it against the approach of insects, for otherwise they may bring the pollen of other flowers, and deposit it on the pistil, and thus destroy the effect of the first operation.

Q. If the object be to raise plants, and flowers, and fruits, of larger size and more luxuriant growth, how are we to proceed ?

A. The most certain means will be to fur-

nish a plant with a favourable soil and climate, and as luxuriant a supply of food as it can endure consistently with health and vigour; at the same time allow an ample space for its branches and leaves to expand and be exposed to the influence of the sun and the air, and protect it from being checked in its growth, or otherwise injured by the weather; you must take care, also, that the blossoms intended to be preserved to produce seeds, are properly impregnated with the plant's own pollen. As a general practice, and where it is difficult to interfere in coupling or pairing the blossoms, the finest and most perfect seeds, fruits, and roots, may be selected from the most perfect plants; raising plants from these, you should again select the seeds, fruits, or roots, and raise plants from them; and thus, by persevering, and taking proper precautions, against promiscuous impregnations by bees and other insects, the greatest improvements may be made, and the good qualities of approved varieties, that are already established, may be continued and sustained.

**Q.** What precautions can be taken, and what means can be adopted to prevent the access of bees and flies to blossoms?

**A.** This must depend on circumstances and situations. When blossoms are selected and impregnated by art, they may be surrounded by coarse gauze, or kept under cover of glass; but when it is required to raise seeds that shall be true to their kind only, it is best done by placing the plants at a great distance from others of the same genera, or by taking care that no others of the same genera shall blossom in their neighbourhood, or by planting such large quantities together, that the bees may satisfy themselves without going to other plants.

#### THE IMPORTANCE OF BONE DUST IN THE CULTIVATION OF PLANTS.

THE extraordinary quantity of this article now in use has given rise to extensive adulteration, and it is quite possible that this evil will be found in many respects to prevent anything like conclusive evidence being collected from experiments, but it will hardly be believed that the enormous demand, even before the publication of the *Repertory of Inventions*, produced such industrious researches, that even the dead were not secure in many parts of the continent. We have the authority of the before mentioned work for saying—

“The exportation of bones from Germany to England constituted a singular epoch in the annals of commerce. Myriads of tons have been already exported without glutting the

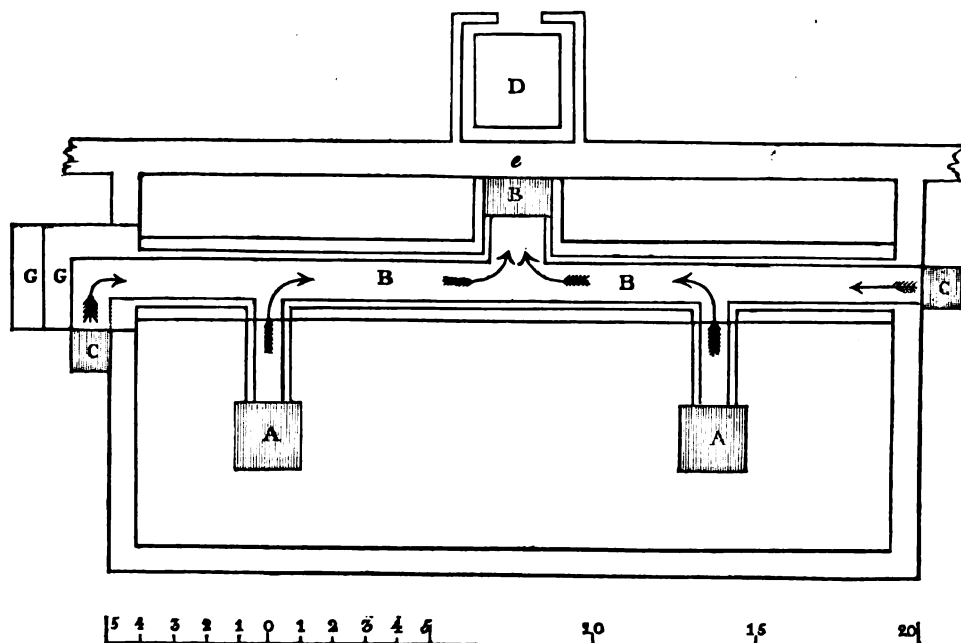
market, or causing a cessation of the demand. In the North Sea, mills have been erected to pulverise them. This bone powder, or dust, was long ago exclusively applied to the purposes of horticulture by German horticulturists; but the English, emboldened by their riches, have extended its use to general objects of agriculture, and fertilise by these expensive means, their cold, humid, and poorest lands; and have thus brought the uplands of Nottinghamshire, the western parts of Holderness, &c., into the highest state of cultivation, both in point of extent and intenseness of fertility. There is, consequently, a proverb, ‘that one ton of German bone dust saves the importation of ten tons of German corn.’ As Malta formerly covered her naked rocks with foreign soil, so does England now fertilise her clay and sandy heaths with German bones. Near the sea-coast even the churchyards are robbed of their venerable relics, which is only excused by rendering the German bone trade popular. An agriculturist, being rendered attentive by this vast exportation, instituted privately some comparative experiments, the results of which proved that bone dust acts in the cultivation of ground, as compared with the best stable manure—1. In respect to the quality of corn as seven to five. 2. In respect to the quantity as five to four.—3. In respect to the durability of the energy of the soils as three to two. It produces several collateral advantages:—1. It destroys weeds. 2. It diminishes the necessity of suffering the land to lie fallow. 3. This concentrated manure, or substitute for manure, is more easy of conveyance, less laborious to spread and can with facility be applied to the steepest vineyards or other high lands, either in mountainous countries or in wet meadow land. 4. It renders agriculture practicable without cattle breeding or grazing.

But generally speaking all decayed animal matter is strong manure. Fish, and the shells of fish are of great service, and it is fortunate that oyster-shells broken up is one of the cheapest means of adulterating bone dust; were it not so, the cupidity of dealers might have introduced mischievous instead of merely weakening matter to increase the bulk. It is far better to buy bones in the lump and grind them. The gardener or farmer knows then what he is about. In using bones for plants, it is far better to use bones as large as horse-beans instead of in powder, for a little excess of the dust is ruinous, while the use of pieces of bones, a bone in small lumps, is not nearly so exciting for the moment, and lasts a much longer period; in all cases, therefore, we should rather use bruised bones than dust.

## HORTICULTURAL BUILDINGS.

COMMUNICATIONS have appeared from, time to time in the *Gardeners' Gazette*, from my esteemed master, William Murray, Esq., of Polmaise, respecting an experiment he was making on the growth of the Vine; and in a

hothouse, where neither smoke flues, nor hot water pipes are used, but simply making the warm air to circulate through the house by Headen's stove. The following plan will, perhaps, make it clearly understood:—



A. The grating where the cold air is admitted to the stove from within the house.

B. The drain conducting the cold air to the stove, over which is the ganway.

C. A valve for admitting fresh air from without, keeping a healthy atmosphere.

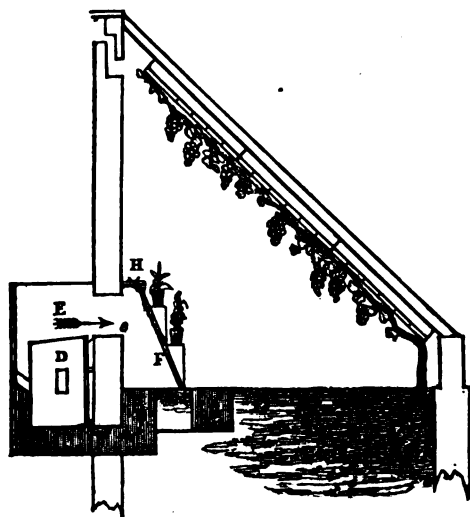
D. The stove.

E. The warm air chambers, and e the outlet from the chamber.

F. The woollen cloth nailed underneath a stage for plants, which extends to within 2 feet from each end of the vinery, dispersing the warm air equally through the vinery, and steaming, by applying water through the rose of a watering pan upon the cloth, &c.

G. Steps into the vinery.

H. Water gutter.



As gardener, I am happy to say, that the

Vines, &c., have exceeded, under my care, our most sanguine expectations, which is manifested in their extraordinary growth of wood, healthiness, and dimensions of leaf, some measuring sixteen and a half by fifteen and a half inches, produced last year handsome bunches of grapes, of the finest size and flavour, with a rich bloom. The approbation which the grapes, &c., have received this season by many of the most eminent practical gardeners and others, has been considerable; and many of them admit that the working of the plan is most excellent for the growth of Vines, and other horticultural purposes, where forcing is required, and is likely to supersede the ordinary mode of forcing, by smoke flues, hot water pipes, &c. The saving of fuel is considerable, and the necessary attendance is less. I may also add, that the woollen cloth, which is about one and three quarters yards wide, and extending within two feet of each end of the Vinery, is coarse,



and thinly wrought, being nicely adapted for the warm air to penetrate through it, and to evaporate the moisture; and for keeping a permanent moisture in the cloth, Mr. Murray is just proceeding to have placed upon the upper shelves of the stage a small water gutter, to be kept full of water from a cistern at the one end, in which is placed several worsted threads, rolled together, suspended over the side of the gutter, at eight inches apart, going down through holes in the shelves, and resting upon cloth, as seen at H. By this Syphon or capillary process the water is gradually conducted from the gutter to the woollen cloth, keeping it constantly wet, if required, producing the finest possible climate for the Vines.—M. C., *Gardener to W. Murray, Esq., of Polmain, Sterling.*

[This ingenious plan is well worth the attention of our horticultural readers.]

#### THE VINES OF SPAIN, AND SPANISH HORTICULTURE.

IN an earlier part of the work we gave a detailed notice of the Vines of France, amounting to five hundred and seventy varieties; we now offer a few remarks on the Vines, and general state of horticulture in Spain, which, although producing the richest wines, only has about one hundred and fifty varieties of grapes, many of which have been successfully raised in New South Wales, under the able superintendence of Mr. Richard Cunningham, formerly of the Royal Gardens of Kew.

*Xeres.*—The soil of Andalusia, which produces the finest wines is called the *alburiza*. It generally contains about seventy per cent. of carbonate of lime, the remainder of the compound being chiefly alumina, with a very small portion of silice, and occasionally a little magnesia; but in some places it is almost pure carbonate of lime. This soil absorbs every drop of moisture which falls upon it, and never cracks or opens in the greatest heats of summer. The other soil is the *arenas*, or sand, which is also very extensive.

In this district the Vines are planted at the distance of five feet from each other both ways. The varieties are the *Pedro Ximenes* and *Ura del Rey*, white, and the *Tintilla*, black. Black grapes are, however, very rarely cultivated. Many of the Vines would be good from one hundred and fifty to two hundred years, were it not for the imprudent manner that some of the men adopt in pruning, which causes them to be attacked by a small destructive insect—a white worm with a black head—that eats into the heart and destroys it, so that numbers of the Vines are rendered useless when they are from forty to fifty years old. The

most approved system in pruning, is to leave one knot of the branch cut off, which prevents the insect entering the stock.

The general mode of the most experienced growers, instead of leaving only one, or, at most, two knots on each of three or four branches, is to leave one branch with seven or eight knots, and two others with one knot each, pruning them down alternately. In case of wet weather they unleave the Vines, thereby allowing the rays of the sun to reach the grapes. The ground is trenched to the depth of a *vara* (thirty-three inches) only, so that the roots may not penetrate too far from the heat of the air. The ground is well manured once in the year, or every two years, according to the richness of the soil, with horse-dung, and well dug over three, or even four times a year; and when first dressed in the winter after the pruning, it is turned up to the depth of fourteen or fifteen inches.

There are very extensive vineyards in the environs of *Xeres*, situate in what are called the *arenas* (sands), the soil of which is a light sandy loam; and though surrounded by hills of chalk, it does not contain the smallest portion of calcareous matter. It is capable of supporting a most vigorous vegetation, and the Vines are pruned accordingly. On each Vine there is at least one long branch, containing from eight to ten knots, and from two to four spurs, with one or two knots each. On some Vines there are two branches, one containing eight or ten knots, the other four or five, besides three or four spurs, with one to four knots each. There are on some as many as twelve knots on one branch, and seven spurs; the crop is in proportion, many of the Vines producing twenty bunches and upwards, making from twenty-five to thirty pounds.

In pruning the young Vines, as well as in pruning them afterwards, great care is taken to have the branches in such a direction that they will balance each other upon the stock, the latter being generally from twelve to eighteen inches from the ground before the branches spring out. The object of this care is to support the bunches from the earth without the aid of props or stakes. When, from the weight of fruit, a prop is required, it consists of a piece of cane, with a fork cut in the end of it, in which the branch rests. The difference in the produce of some vineyards with others is astonishing: one will render only two or three butts per acre, while another will produce six to eight butts of wine from the grape called *Uva del Rey*. These Vines, being in the *arenas*, only require to be manured once in four or five years, as the ground is not so cold as the *alburizas*, or chalky soils. The whole extent of the *Xeres* vineyards which produce wine fit

for the English market does not exceed seven thousand acres, and about double that extent will also include those of Port St. Mary's and San Lucar.

The means by which they irrigate the land in Spain is rather curious, but on a most simple principle, viz., a well is made of about seven feet in diameter, and to the depth of eighty to ninety feet, thereby leaving from ten to twenty feet water. There is a circle round it from thirty to thirty-five feet in diameter, round which a mule turns to put the wheels in motion. There is an horizontal wheel of ten feet, which turns a vertical wheel of eight feet. They act upon each other by a series of teeth, which are merely pegs fixed to the outside wheel. The teeth projecting from the horizontal wheel are ten inches, those from the vertical wheel eight inches in length. The horizontal one is turned by a lever attached to the top of the beam, about ten or eleven feet in height, and falling at an angle to the height of the shoulders of the mule. There are circular bands, made of a kind of grass, to which are attached deep earthen jars, which are placed at equal distances from one another; these are fixed between the two bands by cords varying from thirty-seven to forty in number, and from three to four feet apart. When the wheel is set in motion, they descend empty on one side, and, passing through the water, rise nearly full on the other side of the well. There are three small holes at the bottom of the jars, so as to allow the air to escape. Each of them delivers from four to six English pints at every revolution of the wheel (of ropes). The trough into which they are emptied as the wheel turns, is on a level with its centre, from which it is conducted into the fields and gardens by means of canals and earthen or wooden gutters, and falls into various cisterns, as it may be required to irrigate the grounds. It is also conveyed to the towns through earthen pipes, which empty themselves into large cisterns for the use of the inhabitants, to whom it is sold at so much per pail, as in Paris and other parts of France, the *neris* being all private property. When there is a great demand for water in the very dry season, they double the number of pots by putting one between the other, and yoking a second mule or ox. Artesian wells and pumps are not yet known here.

*Mode of Making the Sherry Wines.*—The presses used in Spain for extracting the juice from the grape are in the shape of large wooden troughs, about eight feet square, and from twelve to fourteen inches deep. This is the general size, and each will contain at one time as many grapes as will yield one butt of wine. A coarse wooden screw stands in the centre of the trough, which is worked by a lever, not

more than five feet long in all, so that each arm is only two and a half feet. In the casks which contain the juice, there is fixed a vessel in the shape of a very wide funnel, passing into the bung-hole. The object of this is to return into the cask all the froth and wine which is thrown up in the fermentation, as all the wine is fermented in butts with only the bung-hole open. It continues in the butt in which it is fermented till March, when it is racked off the lees. The process of pressing is very simple. A large quantity of grapes is heaped up in one part of the trough; they commence by strewing upon them as much powdered gypsum, or sulphate of lime, as a man can take up with both hands. A portion of the grapes are then spread over the bottom of the remainder of the trough, upon which the men jump with great violence, having wooden shoes, with nails, to prevent them slipping. After the greater part of the grapes are pretty well broken, they are piled up round the screw, and a flat band, made of a kind of grass, is wound round the pile, commencing at the bottom, the broken grapes being heaped and pressed in as the band is wrapped higher and higher, till they are all compressed into it. They then commence working the screw, and the *must* flows with great rapidity. The bottoms of the troughs are elevated about two and a half feet above the floor of the cellar, and each has two spouts, under which tubs are placed, and jars in the tubs; and as the jars are filled they are carried away and emptied into the butts. When the whole operation is completed, the bulk of the husks or skins is not more than one-sixth or one-seventh of what the grapes appeared when first placed in the troughs. The vintagers bring in the grapes as they gather them, in buckets or pails, which they carry upon their shoulders. The whole quantity of sherry annually exported from Xeres does not exceed 25,000 butts. In no case do the exporters send a genuine natural wine as it comes from the press without a mixture of other qualities, and a small portion of brandy to prevent it turning, or contracting a scuddiness. No wine is allowed by law to be sold for consumption till it is twelve months old. The very dry wine, called *Amontillado*, is the produce of a particular grape, the *Polomina*. The finest sherries are produced from two or three varieties, which are rather scarce. Very little brandy is made in consequence of its unpleasant or insipid flavour, compared with the fine Cognac of France.

*Orange Groves of Seville.*—The great exports from this city are bitter and sweet oranges and lemons, but the sweet orange is more cultivated than the bitter. The plants are all raised from pips of the bitter orange, and when

the stocks are four years old, they bud them with two or three eyes of the sweet orange. The trees are planted at the distance of twenty-one or twenty-two feet each way, and, in good years, will yield from 1000 to 1500 oranges each. They are irrigated every ten days, and the soil is disposed in small trenches to allow the water to spread. These groves are reckoned of great value, as upwards of eighty vessels, from 70 to 120 tons' burthen, are annually loaded with oranges and lemons for England, but it is a fruit the inhabitants very little use themselves, as they prefer the *Grenadilla*, or pomegranate, which is very abundant; the melon and water melon, which grow most plentifully in the *arenas*, or sandy soils, without manure or the slightest trouble; figs, grapes, chesnuts, olives, &c.

*Olive Plantations.*—The planting of the olive tree is one of great resource to the peasant of Andalusia. Some of the fields are cultivated with corn crops under the olive trees, but they are never manured unless that is the case. The ground is generally of a light sandy loam, and is ploughed once a year. There are five kinds of olives in estimation—one of them, *La Reyna*, is of the size of a large plum, and is very highly prized, being pickled for eating, as the tree of this variety produces but little fruit, which yields a very small quantity of oil when pressed. The olive tree is one of great age, and should not be pruned until they are twenty-five to thirty years old, and then once a year, or every two to five years, as they may require. There are generally from sixty to seventy trees per acre, which are planted at twenty-seven feet apart, yielding about 66  $\frac{2}{3}$  gallons of oil. The mode of extracting it is as follows:—the mill for grinding or crushing the olives consists of a large circular stone, sloping inwards to the centre, where a sufficient space is left level for a millstone of seven feet in diameter, and fourteen inches in thickness, to turn upon its edge. An upright beam, fixed to the centre of the millstone, and turning on a pivot, gives it motion. The olives lie in a heap about fifteen days before they are crushed. After having been crushed they are put into the press, and it is the common practice to pour hot water upon them, in order to extract the oil. They are pressed thrice, and each time with the addition of boiling water supplied from a furnace. The fluid runs from the press to a cistern, and when it is filled, the oil flows over at the top, leaving the water below, which is cleared away as necessary. The only difference between the fine and common oil is, that the former is the virgin juice drawn off with cold water, and not mixed with the second and third pressings. The oil is kept in large earthen jars, some holding 100 gallons

each. (The Spaniards, as well as the French, prefer it when it is a little rancid.)

*Grapes of Malaga.*—In the immediate vicinity of this city the country is extremely rugged, but every patch where it is possible to thrust in a plant is under cultivation. The rocks consist of rugged masses of lime-stone, and a kind of slaty cist, beyond that distance almost every hill is covered with Vines, the produce of which is nearly all converted into raisins. The grapes are nearly all of the large white *Muscatel Gordo* of Roxas Clemente, but they will not succeed in the interior, and therefore all the Muscatel raisins are made within two leagues of the coast. The Lexia raisins, which are used for puddings, &c., are made in the interior. In planting, they do not trench the whole of the ground, but dig out square holes, about two feet in diameter, and not more than twenty inches in depth. The distance at which the Vines on the hills are planted is about seven feet from each other. The soil is every where of a decomposed slate, mixed with abundance of gravel of the same substance. There is no difference made in the distance at which the Vines are planted between the hills and the valleys; although in many places, on the former, the shoots scarcely extend more than ten or twelve inches, while in the latter they extend as many feet. They never, under any circumstances, manure these vineyards. The branches are pruned much closer to the stock than those of Andalusia, as nothing but the half-formed buds, at the junction of the old and new wood, is left to produce the wood of the succeeding year. The number of shoots is almost unlimited, varying from ten to twenty-five, and few have less than ten to fifteen. The stock is close to the ground, and not the slightest effort is made to raise the shoots, or support them from it.

After the pruning they dig over the ground and lay bare the stock, in order to scrape off the *barba*, or small thread-like roots, which are near the surface. The grapes lose about two-thirds of their weight in drying, and, on an average, each vine will yield from 8 to 16 lbs., according to its luxuriance. The wine made from it is most delicious, but as they are worth double when dried, they never make them into wine unless spoiled by the rain. The following is the process of making the Muscatel raisins: They usually commence gathering the grapes about the middle of August, choosing only such bunches as are ripe. They return, after a week or two, to make another selection, and so on for a third and fourth time. A place is always reserved in the vineyard, free from plants, for spreading the grapes when gathered; the soil is always chosen of the darkest colour, in order to its keeping the full force of

the sun's rays during the day, and retaining the heat during the night. The bunches are spread out separately on the ground, and never allowed to press upon each other; they are only turned over once, and at the end of fifteen or eighteen days they are sufficiently dry. Those who use *toldos* or awnings to shelter them from rain or the dews of night, dry them in ten to twelve days. Before the bunches are spread out, the small grapes are picked out, as well as any that may happen to be injured; the small grapes are dried separately. There are three distinct sorts of raisins: 1st, The Muscatel, which are the finest, and are packed in boxes of 25 lbs. (*arrobas*); 2nd, Sun or Bloom raisins,—these are prepared in a manner in every respect similar to the Muscatel, but from a different long grape, called *Uva Larga*. (This description keeps better, and is usually sent to India.) 3rd, The Lexia raisins, which are packed in casks, or grass mats called *frails*. These raisins are of an inferior kind, and require to be dipped in a lye (*Lexia*) of wood ashes, with a little oil, before drying. The *Jordan Almond* also grows in this district.

*Sugar Plantations at Almuncar.*—At this place, forty miles east of Malaga, are the most extensive plantations of sugar in this part of Spain, where it has been cultivated for upwards of 100 years, but not to the extent it might, in consequence of the opposition shown by those in power. Four or five different kinds of cane have been cultivated, but the large Otaheite cane succeeds the best and yields the most. The soil is generally loose and of a sandy quality, but very rich, and is also richly manured. The planting takes place in May, and the canes are cut in February following. The same stools will last for six years. They are cut down to ten inches from the surface, and six plants are put into one hole, which are not more than three feet apart one from the other. The ground is cultivated by ploughs with oxen, but only when the canes are young, or in the early part of the season. It grows to the thickness of a man's arm, and from eighteen to twenty feet high. The rum extracted from it is equal to that of the West Indies. The ordinary range of the thermometer during the day, in the winter months, is 56 to 58 deg.; in May and June, 72 to 75 deg.; in July and August, 78, 82, and 83 deg., and sometimes as high as 100. The range of the barometer is hardly ever more than one inch, being from 29½ to 30½.

*The Mulberry Tree.*—The planting of the Mulberry tree is very general throughout Spain, for the purpose of the breeding of the silkworm, which is daily becoming a very important branch of commerce, both here and in France, as the climate as well as the soil is most propitious.

*The Prickly Pear (Cactus).*—The Prickly Pear grows spontaneously all over the south and east of Spain, and is a favourite fruit with the peasantry. This plant is a most excellent fence for hedges, and is of a very hardy nature. It is only necessary to place at certain distances a leaf or part of a leaf of the plant, and in nineteen instances out of twenty they take root without any further trouble, so that in two or three years they form a most formidable fence. To ensure its striking and its more vigorous growth, a spadeful of manure is generally added. The aloe is also much used for fencing, but it dies off whenever it has once flowered, which is sometimes from twenty, thirty, forty, fifty, to a hundred years, so that it has been called by the people the *centennial aloe*.

#### EXPERIMENTS ON COVERINGS FROM FROST.

THE great question of the present day is what comparison does cloth bear with glass as coverings against frost? When a discussion arose upon which was the best covering for glass frames, many experiments were tried and many others suggested. One of the persons who took part in that discussion, thus describes a very simple and convincing experiment:—On a still frosty night, take three thermometers and place them on a smooth surface (say a grass-plot or gravel walk), at about one yard apart; let him then suspend over one, parallel with but about three inches above the ground, a cambric handkerchief; let him cover the second close down with a similar handkerchief, and leave the third fully exposed to the influence of the atmosphere; and if he will examine them a few hours after they are so placed, he will find the thermometer under the suspended handkerchief registers the highest temperature, while the one covered close down will be little warmer than that fully exposed—and why?—because the suspended handkerchief radiates the heat as it escapes from the earth, and therefore keeps its vicinity warm, while the one laying close on, and forming, as it were, part of, the ground, absorbed the heat, and giving it off to the atmosphere, affords little or no protection to the thermometer. So it is in protecting pits and frames—the covering, if placed on the glass, absorbs the heat; but if it is placed a short distance above the glass it radiates the heat, and, keeps the external air from acting on the frame at all.

Now nothing can be more obvious than the conclusion if the radiation of heat from cloth which does not touch any thing will keep the external air from acting on the frames at all, it will prevent the external air from acting on any thing else, and this in our mind is suffi-

cient to satisfy us that cloth prepared with the transparent varnishes, and used as glasses are, must be efficient as protections, and we are inclined to believe that the advocates of it are right in saying it is more effective than glass. This does not settle the question of light, but as we are always shading in bright weather, we must have too much, and can spare some, so that for many purposes it must be better than glass, because it requires no shading. We object to the term radiation as applied by the experimentalizer, all he wants to prove, however is, that the covering confines the heat and prevents the operation of the external air, so that if the frames are closed when there is no frost, the covering prevents any escape of the heat, and keeps the covered subjects the same temperature they were at when closed.

#### ON CULTIVATION.

##### No. I.

I WELL remember hearing the late learned Professor of Agriculture at Edinburgh comprehend the whole art in two words, "*arare et stercoreare*;" a sufficiently correct definition certainly, but wholly depending on the mode in which the two primary operations are performed. In our present knowledge of the art, we need no lengthened demonstrations drawn from physical or chemical causes, to convince us that, in applying manures to lands abounding with weeds, the efficacy of the manure will be spent in raising these weeds; and that in the working of wet land we often make bad worse, and that manures of any kind are greatly lost in effect, from the imperfect state of the soil affording them no proper opportunity of exerting their influence. In the first case, correct cultivation supposes a total and thorough eradication of weeds—that nothing grown on land except "what is sown;" and though this may not be altogether attainable, as there must ever be a wide difference between possible and ideal excellence; yet the nearer we approach to it, the nearer we approach to perfection. It is often stated by gardeners and farmers, that certain limes and manures encourage the growth of weeds, and on that account they do not use them—and there is no doubt of the fact; but there is as little doubt of the opposite fact, that cultivation encourages the growth of crops also; and that it is the business of the farmer to direct the benefit to be derived from the manures to the maturation of the plants "alone," which he has sown, and on which he depends. When we see lands covered with weeds, and crops choked by them; and when we hear of cultivation and manuring being withheld on account of encouraging the growth of weeds;

and when we see our turfs and pastures well clad with these noxious productions of nature, and what is worse still, when we see such heterogeneous mass preserved, cut, and carefully made into hay, we cannot refrain from expressing our most unqualified censure and disapprobation—for it cannot be called cultivation, but merely a gathering of nature's produce, and "a taking" of such crops as force their way from such limited encouragement as they receive from the apathy, the ignorance, and prejudice of the cultivator. From the quantity of weeds found on the lands of any farmer or gardener, we may very safely judge of his merits as a profitable cultivator of the soil. No doubt many difficulties exist, arising from uncontrollable causes; but, after making due allowance for circumstances, as on light soils and in wet climates, and in cases of dormant seeds, which baffle all cultivation, the above rule will generally apply. Much of the process of cultivating consists in a never-ceasing battle between gardeners and the weeds—and certainly he who, under similar circumstances, has the smallest number, must be allowed the highest meed of praise, for he invariably has the best crops. We have an abundance of writing and speaking on the vast benefits of improved cultivation, but there is a precious small quantity of "acting," on which the whole benefit depends, it would be much better if these phrasemongers would hold their tongues, and show us the improvements, that we might accompany them in their laudatory harangues, and bear witness to the actual benefits derived, instead of being regaled, year after year, with the empty "aroma" of expectation.

Tull's system of complete pulverisation of the land is absolutely necessary to facilitate the eradication of weeds, which, on the medium soils most infested with these troublesome productions, is easily effected, from there loose textures and loamy constitution. On sands and light loams a correction of natural looseness is required, by means of heavy rolls, in order to retain moisture, and to produce a firmness, where the roots of plants may find a sufficient hold. On many stiff loams, and on clays, we find few or no weeds; and this very circumstance of nature's productions being wanting, shows us the necessity of reducing the soil, by artificial means, to a porous and divided state, and of supplying, by pulverisation and manuring, the requisites necessary for the growth of plants. I have ever held Tull's idea of complete pulverisation to be a most just one. A rough cloddy soil cannot afford access to the roots of plants, and though experience never may verify his expectations of dispensing by that means with

the use of manures, that circumstance forms no drawback on the merits of his system, for all original thinkers are men of very sanguine tempers, and consequently apt to carry their theories too far, and beyond the narrow limits within which nature has circumscribed the utmost efforts of human exertion. But in all such cases there generally occurs "something" that observation and experience may seize and apply; and that "something" may be a sufficient recompense for all other failures and misconceptions. Sands and light loams require little preparation; clayey loams require more labour, especially if foul; and in all cases pulverisation may be effected by the common plough, the harrow, and the roll. With the latter of sufficient weight, we hear of grubbers and scuffers producing great effect, and saving a ploughing; there may be reason to suspect a "saving" in the produce as the result; at least my own experience has in all cases induced me to prefer the common implements above named, and properly constructed. When we came to cultivate wet loams and clays, and wet lands of any denomination, we know, from experience, the great difficulty in reducing such soils to a proper degree of pulverisation, owing to the adhesive nature of their constitution and texture, and the retentive subsoil. Wetness proceeds from two causes—springs, or from the surface water not finding a ready escape through the impervious substratum in both cases. Complete drainage must be effected by cutting the springs, and on clay soils by close draining at regular distances. On such soils the effect of manures is rendered in a great degree useless, owing to these natural causes: lime, from its solubility in water, is in most cases wholly misapplied, and it is nearly impossible, at proper seasons, to produce the tilth and pulverisation required. Draining is the only auxiliary known to us in our endeavours to cultivate these lands in a proper manner; the profitable results are well known, and only want the application.

#### ÆSCHYNANTHUS PARASITICA.

At the request of a Correspondent we give a more lengthened description of the interesting subject.—

A climbing shrub, which in its native country spreads over the stems of trees, sending forth roots which penetrate into the outer bark of the trees, and give the plant the appearance of a parasite, although in fact it is rather an epiphyte, in the manner of the generality of tropical orchidaceæ. Branches smooth and somewhat fleshy, though more slender than in other species; the flowering branches pendulous in the wild state. Leaves opposite on short

footstalks, lanceolate, three to six inches long, ending in a long but not sharp point, perfectly entire, contracted at the base, smooth, thick, and fleshy, usually a little folded upwards along the mid-rib and waved on the margin, without any lateral veins. Flowers in terminal sessile, umbels of about six flowers, each flower on a pedicel of from a quarter to half an inch in length. In the wild state, in which the flowering branches hang, each pedicel is recurved, so that the flowers, though reflected with relation to the stem, are, in fact, ascending; in our stoves, where the stems have been hitherto unnaturally trained upwards, the pedicels do not lengthen so much, and are straight, so that the flowers are erect or nearly so, and in a closer head. Calyx bell-shaped, but not spreading, smooth, green, half an inch long, divided to about the middle into five narrow ovate pointed lobes. Corolla tubular, from an inch and a half to near two inches long, swelling above the middle and more or less incurved, covered with short hairs, of a rich vermilion colour in the specimens which have flowered in this country, but described as varying to orange or brick red; the limb cleft into five erect divisions, nearly equal to each other and obscurely arranged in two lips. the two upper divisions being less deeply cleft, and the lowest rather longer and narrower than the rest. Stamens exserted, the filaments hairy, the anthers oblong, joined two and two together by their apex. Style exserted, smooth, with a large oblique peltate or somewhat funnel-shaped stigma. Capsule eight or ten inches long, very narrow. Seeds very numerous and minute, with two white hairs at the upper end and one at the lower, each hair very slender and about half an inch long, this is to say, full twelve times the length of the seed. Although the Orchidaceæ form by far the greatest proportion of the epiphytes, which adorn the stems of trees in damp tropical climates, yet they are far from being the only ones. Several Gesneriaceæ of other genera, besides Melastomaceæ, Rubiaceæ, Asclepiadaceæ, &c., have long since received, on this account, the specific name of parasite, and are often objects of great beauty. Hitherto, indeed, they have been but little known, partly from the difficulty of preserving specimens of thick fleshy plants, as they usually are, and partly from the art of cultivating them being a creation, as it were, but of yesterday. But now that attention is so much turned to this branch of horticulture, it is to be hoped that we may soon see our epiphyte houses as varied and rich as our other stoves; and surely none can better deserve a place in them than the splendid genus of which this plant is the first, and hitherto the only, representative which has found its way to this country. It

is a native of Sylhet, a province of Bengal, and has long been cultivated in the Calcutta Botanic Garden. Mr. Brown clearly shows that "those botanists who have endeavoured to establish the American Gesneriaceæ and the Asiatic Cyrtandraceæ as two distinct natural orders, have relied upon characters which in some cases have proved vague or fallacious, in others not to agree with the geographical distinctions which they had served to establish. Indeed, in one instance, a Mexican plant, supposed to be a distinct genus of American Gesneriaceæ (the *Klugia* of Schlechtendal), turns out upon examination to be but a species of the East Indian Cyrtandraceous genus *Glossanthus*. He, therefore, unites the whole into one natural order under the name of Gesneriaceæ, divided into three tribes; the Gesneriæ with an adherent ovary and albuminous seeds; the Besleriæ, with free ovary and the seeds of Gesneriæ; and Cyrtandraceæ, also with a free ovary, but little or no albumen to the seeds. The order, thus formed, it must be admitted, is a very natural one, differing botanically from the extensive order of Scrophulariaceæ by the ovary always consisting of a single cell instead of two. In appearance they are usually much handsomer, having seldom that weedy look peculiar to a large number of Scrophulariaceæ, and the flowers being very frequently scarlet, or a rich purple, or blue, colours very uncommon in Scrophulariaceæ, and even where they are pale or whitish, their large size often compensates for their want of colour. They are therefore, in general, most desirable acquisitions, for though

they mostly require stove heat, they are either herbs or low shrubs, or at any rate will produce their flowers before they attain any great height, and few good collections are now without some species of *Gesnera*, *Gloxinia*, *Trevirana*, or *Streptocarpus*, although by far the greater number, and many of the most conspicuous, are only known as yet by dried specimens." We owe the introduction of this valuable addition to our stove collections, to Dr. Wallich, the zealous superintendent of the Calcutta Botanic Gardens, who transmitted plants, some years since, to his Grace the Duke of Northumberland, from one of which, by his Grace's obliging permission, our drawing was taken in January last. The plant has been grown and trained in the manner of terrestrial stove plants in which it will thrive well, but the flowers are placed in the unnatural position above mentioned; it is, therefore, to be expected, that if treated like the more creeping kinds of orchidaceous epiphytes and allowed old bark to cling to and hang from, not only would the general appearance be more natural and graceful, but the size and beauty of the heads of flowers would be much increased. When cultivated as a terrestrial plant its soil should be a vegetable compost, light, and well drained. The sort of pot in which this and similar plants are kept, is a matter of more moment than is usually believed; they should be soft and pervious to moisture, not made retentive of water by hard burning. We are indebted to the *Botanist* for some of these particulars, a work worthy of very general patronage—instructive and entertaining.

## GLENNY'S GARDEN PRACTICE.

### KITCHEN GARDEN—AUGUST.

**CABBAGE SEED** may be sown, and very small seedlings may be pricked out.

**SEEDS** of all kinds as they are ripening should be gathered before the pods split or the seeds be wasted.

Prepare beds for *Asparagus* four feet wide and three feet apart, by throwing out the stuff two feet deep, and laying turf all over the bottom wrong side upwards; the soil thrown out may be mixed with one-half rotten dung, or leaf mould and dung mixed, at the end of the month: after it has been mixed well two or three times it may be thrown in again till it is level with the surface, and rather on the rise in the centre, the remaining stuff may still lay in a ridge along the paths between the beds.

Choose vacant spaces to trench in some horse-raddish and by no means depend upon any patches you have about the garden for a supply of good sticks.

**CHAPMAN'S POTATOES.**—Procure the sorts true, that you may not have all your trouble for nothing, then get ready a piece of ground in a good open situation, and plant the sets whole nine inches apart in the row, and the rows eighteen. The first week is the proper time for planting; after which they only require cleaning, and earthing like other potatoes, till the first week in November, or if the haulm be very green it may be rather later.—These potatoes, being pitted in a good dry situation with the earth all among them, are equal to the finest growth of new potatoes from November till the end of May, and tons weight are eaten for new potatoes by the inhabitants of the metropolis.

**WINTER GREENS.**—The crops of Cabbage, Kale, Broccoli, &c. must be completed, planting them out in all vacant places after well dressing the ground.

**WINTER SPINACH** may be sown, and that already up may be thinned.

**LETTUCE**, and salads of the various kinds may be sown, and Lettuce planted out.

**ONIONS** may be also sown, and any that are not yet harvested may be got in as soon as they can be pulled and dried, especially all picklers that have ripened off.

**CELLERY** should be earthed up constantly as it grows, and dry days should always be selected for the operation, the remaining plants in the seed-bed may be planted in rows in the level ground.

Sow **TURNIP** seed for your last crop, the early kinds do best, such as the white stone.

**MAKE MUSHROOM BEDS** if you have none, and if you have no convenience for them, spawn your declining cucumber or melon frames in which the heat has not altogether gone, the easiest mode of doing this is to rake the surface even after stirring the mould, and take off all but about two inches thickness, place lumps of spawn close down on the dung by making holes six inches apart all over the bed and cover them up with the mould, and afterwards put on the glasses, the lumps should be half as large as hen's eggs. This frequently affords an excellent crop, but regular beds are made against a wall or under a roof, those in an outhouse or shed answer the best, and are most indifferent to the weather, various are the forms adopted for beds. Against a wall the dung is formed into a mere slope, under a roof it is formed like a bank. The following has been recommended as the best plan by all the writers from Abercrombie down to Rogers.

*Preparations of the Dung for the Bed.*—For this purpose none answers so well as that of the horse, when taken fresh from the stable; the more droppings in it the better.

A quantity of the dung mentioned should be collected, and thrown together in a heap, to ferment and acquire heat; and as this heat generally proves too violent at first, it should, previously to making the bed, be reduced to a proper temperature; by frequently turning it in the course of the fortnight or three weeks, which time it will most likely require for all the parts to get into an even state of fermentation, during the above time, should it be showery weather, the heap will require some sort of temporary protection, by covering it.

On the space marked for making the bed a trench should be thrown out about six inches deep; the mould may be laid regularly at the side, and, if good, it will do for earthing the bed hereafter; otherwise, if brought from a distance, that of a more loamy than a sandy nature will be best; or a bed may be made on the surface; either in the trench, or upon the

surface, there should be laid about four inches of good dung, not too short, for forming the bottom of the bed; then lay on the prepared dung a few inches thick, regularly over the surface, beating it as regularly down with the fork; continue thus gradually drawing in the sides to the height of five feet, until it narrows to the top like the ridge of a house. In that state it may remain for ten days or a fortnight, during which time the heat should be examined towards the middle of the bed, by thrusting some small sharp sticks down in three or four places; and when found of a gentle heat (not too hot) the bed may be spawned, for which purpose the spawn should be broken regularly into pieces, about an inch and a half or two inches square, beginning within six inches of the bottom of the bed, and in lines about eight inches apart; the same distance would also do for the pieces of spawn, which, in a dung ridge, are best put in by one hand, raising the dung up a few inches, whilst, with the other, the spawn can be laid in, and covered at the same time. After spawning the bed, if it is found to be in that regular state of heat before-mentioned, it may be earthed. After the surface is levelled with the back of the spade, there should be laid on two inches of mould—that out of the trench, if dry and good, will do; otherwise, if to be brought, and a choice made, that of a kindly loam is to be preferred. After having been laid on, it is to be beaten closely together, and when the whole is finished, the bed must be covered about a foot thick with good oat straw; over which should be laid mats, for the double purpose of keeping the bed dry, and of securing the covering from being blown off. In the course of two or three days the bed should be examined, and if it is considered that the heat is likely to increase, the covering must be diminished for a few days, which is better than taking it entirely off.

This is the most common way of growing Mushrooms; but I have seen excellent produce from pots half filled with droppings, a lump of spawn on the top, and covered with mould—the pots being placed in a greenhouse or stove; also from a foot thickness of horse-droppings, and lumps of spawn on the top, and this covered with mould on the floors of vineries.

#### FRUIT GARDEN.

**STRAWBERRIES.**—Select from the kinds you wish to increase some of the strongest runners, those which are rooted, or indicate rooting. Trench and well dress any piece of ground on the south side, or rather, a south wall, and there plant the runners, about six inches apart in the rows, and the rows about a foot apart. Here, if attended to, well watered, weeded, and the earth pressed close about them, they will grow, and bear well the very first spring. In



the kitchen garden it is proper to edge all the borders under the southern walls with Strawberries in preference to any thing, while all those beds and borders not so warm may be edged with parsley.

**WALL-FRUIT TREES.**—Hang up bottles with sugar and beer in them to trap the wasps and flies: hunt early and late for snails and slugs; take off useless and wiry little shoots wherever they are coming, to throw more strength into the wood you require; thin your grapes out-of-doors, leaving none but the best grown, and no more of those than you wish to see swell, as they detract from one another; pinch off all the extra shoots which occasionally grow out where the branch has been stopped. In gathering fruit, do not strip the branches as you go on, but select the finest all over the tree, leaving on those best adapted to hang longer.

**THE GATHERING OF FRUIT** in orchards is generally so managed as to make the whole produce rough and inferior. The labour of gathering induces most people to clear a tree at once, instead of three or four different gatherings. In the pears, plums, and wall-fruit especially, this is a bad plan. By gathering the fruit on a tree as early as they are ready, the quality of the remainder will be wonderfully improved; hence, the importance of timely thinning many sorts of fruit. It is not uncommon for those who attend to these matters to go five or six times over a cherry-tree, and take only the finest and forwardest each time. With gooseberries and currants this should be attended to from the first gathering while green, for the use of the house, and those left to ripen should be few and far between.

#### FLOWER GARDEN.

**THE DAHLIA** now occupies much attention and requires it all. The coming into bloom is a general invitation to earwigs, small snails, and some kinds of caterpillars, which is rarely declined on the part of vermin, and constant watching and trapping are absolutely necessary. Pick off each imperfect bloom or bud as soon as it is forward enough to show that it will be imperfect: so also pluck every one the instant it has passed its perfection, that the plant may not be spent in swelling the seed, the only exception to this is when you wish to save the seed, but even then, you had better save none than save it from imperfect flowers, and one or two pods from the best marked flowers will do more good than twenty pods from faulty ones. Trim out any branches that come too close, or cross each other, or will not allow room to grow, and you may stop the ends of any shoots on which there happens to be a bloom that you intend to mature for exhibition, but if you want the flowers abundant,

and desire the plant as an ornament to the garden and not for exhibition, none of the blooms should be taken off until their beauty has gone. Those who want to show them will find that if any blooms come well on the shady side of the plant, and the plants are pretty clear of vermin, they will beat all those grown under pots and glasses, but where they are on the sunny side, or in cases of high wind, and much wet, it may be desirable to cover or protect by some means; all the modes of shading and protecting are explained in the treatise published in the early part of *The Gardener and Practical Florist*; a bloom grown without will stand much better than one that has been covered up, and are far better to carry any distance. All the plants must be tied to their stakes and three or four other stakes must be driven in to support their new growth if necessary.

**CARNATIONS AND PICCOTEES.**—Any that are not done yet, should be layered without loss of time, and great care must be taken that they are kept moist, as neglect in this particular will always delay, and sometimes prevent their striking.

**AURICULAS.**—Some of those not repotted should be examined, and if the pot be very full of roots they should have the mould shaken from the roots, and every vestige of decay taken from them; occasionally the tap root will be found to have commenced rotting at the lower end, or at some portion of it: a sharp knife must be used to remove this, even if it take half the root away or cause you to cut half through it. Those however who grow Auriculas in loam and cow-dung rarely have to do this to any extent, but it is requisite to examine all plants that are bought in as they are often so, when they are potted into a size larger pots, or it may be into the same pots again with new compost. Many experiments have been tried with regard to the best period for potting, and various opinions have been published, but between June and September there seems but small difference, unless they are set growing. I have always fancied that late potting gave me less autumnal blooms than early potting, and unless the pots are upon examination full of roots, or there is some indication of decrease, I prefer letting them go two years in the same pot, nor do I wantonly cut off roots when healthy, for I am quite convinced that it promotes a premature bloom, which, even if removed immediately after it appears, weakens the plant for the spring bloom which often in consequence comes out of character. The compost for the Auricula has already been noticed in the earlier portion of the practice.

**FLOWER SEEDS.**—Gather regularly as they

approach ripeness, they must not be left on the plant till the pods split, for that is a certain loss, and sometimes an annoyance, for flowers are as bad as weeds if they come where they are not wanted. They should be hung up or laid in the shade to dry.

**PANSEYS.**—Rooted cuttings may be planted out to form new succession beds. Cuttings and side shoots may be taken off old plants to strike: water must be administered frequently, and they will be all the better for the earth being occasionally stirred between them. Seed may be sown as soon as it ripens, and the pots or pans in which it is sown may be placed in the shade a-while, until the seeds are up and pretty strong. If you are about to save seed from a few good varieties, place a few by themselves, far away from the general collection. Have none but clear white grounds or clear yellow grounds, thick petals, smooth edges, and round flowers; save seed only from those particular blooms that are most perfect, which should be marked, and pick all others off before they even expand: when your pod or two on each plant are set well, allow no more flowers to bloom till your seed is ripe, when you may gather it and sow it directly, save from the cuttings rooted and planted out recently, not from plants that have spent themselves.

**FLOWERING PLANTS.** such as Penstemons, Salvias, and other tall subjects, must be neatly tied up to sticks which should be painted black not green, the former is much less easily seen than any other colour, green especially never matches the foliage, and the darker it is the less easily it is discovered.

**WEEDING** should be looked well after, or they will shed the seeds and make a day's work for you next year, for every five minutes you neglect it this.

**GERANIUMS.**—Struck cuttings may be potted in sixties, and be stood out in any sheltered situation to grow, they should be topped, and if at all inclined to rambling, well cut in to form bushy plants, they require watering often. Some of our very knowing readers may laugh at our advice to be careful that no plants be allowed to perish for want of water in wet weather; but if the borders be examined, many a plant will be found that never receives a drop of rain; and among the pots exposed to the rain in the open ground, many a good specimen, which completely shelters the soil it grows in from moisture, will be discovered in want of water, while half the garden is drowned. Examine pots, therefore, more particularly in wet weather than in dry, for in dry weather all receive it mechanically, too much so. Old plants done flowering must be treated according to your intentions, either to grow them large

or keep them moderate size. They may be cut into form at all events, if they were not cut last month.

**ROSES.**—Cuttings of the smooth wooded varieties, and Chinas will strike freely in the shade; place a number of them in each pot, cover with a glass, or put the pots containing them under a hand-glass or in a cold frame; or they may be put in the open ground where they can be conveniently shaded. Any of the sorts which will grow on the common China stocks may be budded as well now as at any time, and the best use that can be made of the old common China grown to any size against a wall or house, is to bud some of the most showy of the prolific blooming kinds of different colours upon some of the best branches, and cut the rest of the tree away, almost every one of the smooth barked kinds will bud well upon the China stock.

Cuttings of Greenhouse or even Stove plants may be taken off and struck, the former (except hard wooded sorts) in a common border under a hand glass, the latter in a hot bed under a bell glass.

**MIGNIONETTE** and ten week stocks may be sown for bringing into bloom in time for the dwelling house in winter, or for the conservatory.

**MANY** subjects may yet be planted in the borders for late flowering at the beginning of the month, seedling Verbenas, Petunias, late sown China asters, Dahlias, Balsams, &c. They should be carefully removed, well watered in, and the evening, or morning, or a dull day be chosen.

**HERBACEOUS PLANTS** past flowering may be still propagated by chopping pieces off round the patches, and planting them out, or by being taken up and regularly parted and planted out in beds.

**CUTTINGS OF DAHLIAS.**—The side shoots of very choice Dahlias which it may be desirable to propagate, should be taken off before they get more than two or three pair of leaves long, for the growth of the side shoots is rapid, and the stem soon gets hollow which is greatly against their striking root. The cuttings should be shortened up very close to the joint, and the two lower leaves should be taken off with a sharp knife, so as not in the least to bruise the bark. These must be struck the same as spring cuttings with strong bottom heat, and they must be shaded from the hot sun. They may be struck half a dozen in a pot round the edge, but must be repotted as soon as they are safe and kept in the frame sometime.

**TULIPS.**—Towards the end of this month, all the smallest offsets must be planted, otherwise they would perish before the ordinary planting time of the collection.

## FOUNTAINS.

THE great beauty of these additions to a garden, and the comparatively small cost, render it surprising to us that they are not more generally employed. There are few situations in which there are the requisites for a Fountain without some artificial contrivance. It is certain that there must be a head of water somewhere considerably above the level, and this must be conveyed to the design by means of a pipe underground, or at least out of sight, but what if we inform our readers that at a place of some note, where there were at least half a dozen ornamental fountains, all there was to make them play their part was a water-butt, which filled with rain when there was enough of it, and was filled by a common force pump when there was much dry weather. In such a case as this there must be some economy of water observed. The Fountains only played when there was somebody to look at them, because they required a man constantly at work while they did play, though every one was turned off and on at pleasure. The description of the various modes of supplying a Fountain would occupy a volume, but there is one which is worth noticing, especially for its adaptation wherever there is a flow of water: suppose a brook, for instance, comes through premises, and the highest part of that brook was only three feet above the lowest part where it runs off; by the application of a water-ram, a simple and useful contrivance, water can be raised to ninety feet high, so that it is only necessary to find a place, or form a place strong enough to hold a head of water, and by the means of this ram a continuous supply may be had at the full height without manual labour. It is thus described:—

“The Ram, which was invented about 300 years ago, is a machine for raising water to any given height, by means of the momentum of a stream of water flowing through a pipe, the passage of the pipe being stopped by a valve, which is raised by the stream as soon as its motion becomes sufficiently rapid, the whole column of water concentrates on the valve, and acts as a single solid, so that it must resist any pressure. It is a matter of astonishment that a machine possessing so many advantages as the water Ram, (the price of which is from £8, upwards) is not in more general use, when its utility is considered. There are not more than 300 of them in use.”

By means of this very simple apparatus, you may raise the water from a cistern, where it is laid on in the lower part of the premises to fill vats or tanks at the top of the house, and a small pipe conveyed down, out of sight, through any device in a garden, will play a jet of very

considerable power and height. By the same contrivance a reservoir or pond on the top of a hill may be filled from a running stream at the lowest part of a valley, and at any distance; we, therefore, are a little astonished, that ornaments so very well calculated to embellish even the finest garden should be so neglected. This brings us to the consideration of the defunct Fountains in Bushy Park; we may be told about the expense of repairing, the difficulty of the job, and the fifty other objections which can be urged against putting the fountain in order; but we deny the right of any government to allow the public edifices and grounds to remain out of repair. If the Fountain and pond are not to be kept in order, let them be destroyed, but it is discreditable to see a noble design, calculated to enhance the beauty of a popular drive, allowed to stand as a memento of neglect in a government, which can expend, somehow or other, something like fifty millions per annum, but which is too parsimonious to keep up, in working order, one of the handsomest objects about the Hampton Court Palace. This, however, is digression.



We have given a design for a fountain, drawn by one artist, and spoiled by another. It was an attempt to transfer a very beautiful subject,

by means of one of the novelties of the day, from the original paper to a copper plate, and may be shown as a failure. Nevertheless, we will give the process a fair chance, and publish some that have answered the best expectation, and will, we have no doubt, redeem the system from condemnation.

#### TULIPS FROM SEED.

SEED is now ripening fast, and some may be sown towards the end of the month (and followed also at the end of September, October, and November by other seed) which is when the seed would sow itself. I may as well give an outline of the whole culture, as it is a four or five years' job to get breeders.

For a hundred or two seeds take a common twelve-sized pot; put about an inch or an inch and a half layer of crocks, and fill up the pot with a rich light compost, tolerably free from stones, such as would be used for Carnations; shake it down a little, and level the top even with the edge of the pot. Spread the seed on this (or even place them, if you have but few, half an inch apart every way); plunge this in the ground in a frame up to the rim of the pot, as the earth settles down, by watering, sift the same kind of compost on the seeds, covering them to half an inch in depth, and not more. When they come up, sift the same kind of light rich earth upon them; for, without doubling down the grass, it will raise the soil above the embryo bulbs. The heat of the sun and the extreme of the frost must be kept from the plants, no matter how; the one or the other would stint the growth, if not kill them; nor must they ever be dry. When the grass has turned yellow, sift the mould through a small sieve, and collect your bulbs; or if they be not very near together, you may allow them to stand a second year; but they grow larger when taken up, and kept out of the ground a short time. In October plant them again in pots, an inch apart, and sink and take them up as before. The third year plant them again in October, two inches apart in the row, and two inches deep, in a properly prepared bed of rich earth, and let the rows be six inches apart. Here they must have a foot, at least, of good soil, free from large stones, and be kept very clear from weeds. When they die down, they must be taken up again. The fourth year they must be planted three inches apart in the row, and three inches deep, and be taken up as before, when the foliage is decayed. The fifth year plant the bulbs four inches apart, in good compost, as before, and in October this year many will bloom of a self colour and if they have thin petals, pointed petals, foul bottoms, or are of a bad form, throw them away before they have done bloom-

ing—it prevents mistakes; and throw away all their offsets at the same time. If they have thick petals, round at the ends, forming a good cup, and having a clean yellow or white bottom, mark them to be kept separate from that season onwards, and place them, on taking up, in separate bags or boxes, with their increase; so that, when any one breaks into colours, the whole of that variety may be either saved or destroyed, as they may deserve.

Thus, in five years may the sower of Tulip seed be instrumental in adding valuable breeders, and even broke flowers, to the splendid collection the English already boast; and thus may a single flower-pot for two years, and a bed a few yards long three other years, immortalise a florist. And be it known, that there are fewer good flowers, and more room to improve, among Tulips, than among any other flowers I know. The success of the florist in Tulip growing will be retarded or advanced by the watching of the plants, and attending to the watering the first two seasons. After this, the Tulips will want but little looking after, except at taking-up time and planting time. While out of ground they only want to be dry and have air; and though I could have written a treatise, without telling any more about raising Tulips from seed, I expect the reader is just as well content as if he had been induced to buy a book.

#### THE PINE APPLE.

To give in a few words the lessons of one-half the pine growers is a great object, when writers are numberless, and modes various. To take the most generally successful points is the best for the use of the amateur. The market-gardener disroots his pines to hasten fruiting; he cares nothing about fruit above the average; but an amateur would rather let them come at any season they like, and takes no pains to force them at one particular season. It better suits the purpose of any family to have the season of their fruiting spread over a wider season, and therefore to adopt a plan requiring the least trouble, and prevent all the fruit coming in a glut. The following practice is therefore recommended. Though Mr. Marnock, a practical man, says he does not agree with the plan of growing without disrooting, we know it is practised at many gentlemen's establishments, and answers best. One-half of the writers, also, recommend disrooting; and except in this one point, the practice is as nearly as may be assimilated to the best points in all their practice, except that of the one-shift system.

The pine-apple may be raised from seeds; but the more general modes of obtaining and keeping up a stock of plants, is by means of

suckers, which are produced plentifully on the stems, and crowns which are formed on the summit of the fruit. The former of these are, however, preferable to the latter, inasmuch as they produce fruit sooner, and owing to the frequently diminutive size of crowns, suckers generally produce the strongest plants. In separating them from their parent stem, it is necessary to pull gently sideways, in order to detach them without injuring at their base, which latter should be fully matured, and assuming a brownish tint before they are in a state fit for planting. The exact time of performing this is a matter of slight importance, provided they are thus matured; but generally speaking, those produced on plants which ripen their fruit in summer, are in a fit state during the months of August and September. On plants which perfect their fruit at a later season, they are not generally matured, and in that case are better deferred till February or March. At whatever time they are taken off, proceed to pot them in light dry soil, in pots varying according to the size of the suckers; those known as 48's will be suitable to the majority. I cannot approve of the practice of laying them to dry before planting; in my opinion it is quite unneeded, and by depriving them of the nutriment stored up in the foliage, tend very much not only to retard, but to weaken their growth. When all are planted, plunge them in a brisk bottom heat, keep them as close as possible, and attend to shading them till they begin growing; very little water in the pots is needed till this is the case, but a slight occasional syringing round the sides of the pit before covering at night, will be beneficial in producing a general moisture, without which a high temperature is injurious. This atmospheric moisture must be regulated with caution, especially as the winter approaches, otherwise if carried beyond due bounds, its effects will soon be injuriously apparent. When they have commenced growing, and the roots thicken on the sides of the balls of earth, they will require shifting into a size larger pot, and allowing plenty of room for a free circulation of light and air. Abundance of the latter admitted with care, as the season and weather may permit, to produce a strong and healthy growth, with a gentle bottom heat; moderate refreshments of water, applied with great caution as each plant may require it (usually in winter about once in ten or fourteen days, in spring once a week, and twice in summer); a moist humid atmosphere, kept up by syringing the pipes and sides of the pit; shifting into a larger pot when the roots thicken on the ball of earth; covering at night in cold weather; a slight shading in the heat of the day in summer; and a temperature ranging from 60 to 65 degrees in winter, 65 to 70 degrees in spring

and autumn, when growing freely, and 70 to 75, or 80 degrees in summer (allowing from 5 to 10 degrees, according to the season, for the effect of sun heat), kept up by means of the hot water apparatus. These may be said to comprise the leading points of cultivating the pineapple in its first stage—the nursery pit. The treatment of crowns may be assimilated with the above, with the slight exception of their being kept a day or two to allow the fleshy part of their base to become a little firm and dry. Plants raised from crowns are longer in arriving at a fruiting state than suckers, and hence the latter are most generally preferred. Many of the suckers planted in August, as above, will probably be advanced sufficiently to receive their first shift in October, at the same time the bark or leaf bed is made up for the winter. In most cases this may be expected to require repeating in March or April, as hereinafter directed; the state of the roots being at all times taken as the guide in performing this operation. As vacancies occur in the succession-house, by removing these plants to supply any blanks in the fruiting stove, they are to be constantly filled up with the largest and best plants selected from the nursery stock. *Succession Pit.*—Their treatment in this structure is merely a continuation of the above. In the spring shifting before noticed, it is necessary to remove carefully the outsides of the balls, and to examine and cut clear away any rootlets that may either be decayed or decaying. This point is to be borne in mind at all future pottings. I disapprove of the practice of disrooting altogether at any period of their growth; but as the roots of the pine are produced continuously from the bottom of the stem upwards, my opinion is, that the removal of the extreme base may be advantageous. I am perfectly convinced that by the removal of the decayed roots, which will be chiefly found at the bottom, and stripping off two or three of the lower leaves, and setting the plants rather deep in the pots, plenty of vigorous fibres will be the result. The renewal of the bark bed will at this period be an important operation; it must always be regulated by the heat contained in the bed, and may accordingly be deferred a week or two, or otherwise, for too much or too little bottom heat is alike injurious. A steady temperature should be kept up, ranging from 60 to 75 degrees, and a constant supply of fresh air admitted at every opportunity. Water, in small quantities, as often as they require it, which will entirely be governed by the weather. On this point Speechly observes, that "Plants lately re-potted till the roots become thick, require less water than before shifting. Plants in large pots, in proportion to the size, do not require so much water

as those under potted. Plants in a vigorous growing state, require frequent and gentle waterings; but in all cases less should be given in moist than in dry weather, as the humidity of the atmosphere, in a great measure, supplies the place of water at the roots: on which account recourse should be had to the production of artificial dews, by syringing the hot-water pipes and sides of the pit several times every day (except in the heat of the sun), and also over the plants with the finest cap or rose, once, twice, or three times a week, in warm dry weather. By this I do not intend the application of so great a quantity of water, as to produce an injurious effect, it should be applied with moderation in spring and autumn, more freely in summer, and almost entirely discontinued in the winter season; at any time a moderate sized watering-can full of *tepid* water will be sufficient for a house containing a hundred plants. The pipes, &c., should, however, as before observed, be damped several times a day. Shading of succession plants forms an important feature in their treatment. It has been observed that they do not make half the progress in hot sunny weather that they do in spring and towards autumn, when the sun is not so powerful; to obviate this, a thin covering should be used in the middle of the day in hot weather, to break the rays of the sun, but not thick enough to exclude light, or which will be found much better, the frame light made with the white varnished calico, or Irish linen. By rigidly pursuing this treatment till the middle or end of August, it may be anticipated that the plants, or rather roots, will be in a condition to receive their last shift into the pots in which they are to produce fruit; at the same time, or soon after, they are to take their position in the bark bed of the fruiting stove, which is to be prepared for them as soon as the major part of the ripening fruit has been cut; at this shifting the pots generally used are eleven inches wide at top, by ten deep. It is necessary here to remark, that the largest plants from the succession pits are here spoken of as being intended for the fruiting house; and their place is again to be filled up from the nursery department. This treatment being annually repeated, it follows, that whilst many of the suckers taken off the autumn previous, are now to take their place for fruiting, a considerable proportion will possibly not be sufficiently advanced, and must, consequently, remain till the next remove; in this case they require re-potting into the same pots, and their former treatment resumed. Most cultivators agree that a rich loamy soil is requisite to grow the Pine successfully. I prefer one composed as follows:—Two barrows full of sandy loam, being the surface of a pasture; one ditto of sheep or

pigeons' dung; half ditto of coarse sand. In shifting, *drain the pots well* with two inches of broken potsherds, and on that a layer of turf, broken small. Set the plants rather deep in the pots, and cover the surface and about the stem with another layer of turf, which holds the plants firm, and readily admits the water to percolate through into the soil beneath. My reason for preferring a soil rather porous than otherwise, and attaching so much importance to drainage, is simply because no plants are more injured by stagnant water at the root than the Pine; at the same time it requires a liberal supply, both whilst growing rapidly and swelling its fruit. Liquid manure is highly beneficial, if judiciously used, and the water made use of must be tepid at least from September till May. *Fruiting Stove*.—The plants being as already noticed, shifted and plunged in the renewed bark bed of the fruiting stove, will require moderate refreshments of water every eight or ten days, decreasing it as the short dull days draw on. Fresh air must be admitted with discretion on all mild days, and from sixty-five to seventy degrees of heat kept up during the winter season. By the month of March the plants will many of them be showing fruit, and if their treatment has been properly attended to, they will do this without any lowering of temperature, or suspension of watering; these practices cannot be too strongly condemned, reducing as they do the plants to a state of imbecility and weakness, at the very time they should be in their greatest vigour to form the rudiments of the fruit. If sufficient attention has been paid so that the roots may have filled the pots, at or about the time at which it is desired they should show fruit, there will be no occasion for using unnatural measures, by checking the growth of the plants. During the time they are in flower, no water should be given overhead; but when the fruit has fairly set, they may be occasionally syringed freely, until it is necessary to withhold water entirely, keeping the temperature from seventy to seventy-five or eighty degrees, and liberal watering at the roots, together with a generous use of that element about the pipes and pathways, to produce a genial atmosphere, to swell off the fruit to its fullest perfection, are the chief attentions required. This liberal treatment must be suppressed, however, as the fruit approaches maturity, or the flavour will be deteriorated. Water given in less quantities must be gradually withheld, and the atmosphere rendered somewhat arid. To retard the ripening of the fruit so as to keep up a succession, part of the plants may be taken from the stove when nearly ripe, and set in a dry shed, the pots covered with damp moss, but no water given. It will be needful

to return them to the stove for a week before the fruit is cut, to heighten the poignancy of its flavour. After the fruit is fully ripe, cut off the leaves near the stem, to encourage the growth of the suckers, from two to three of which should have been retained, whilst the rest should have been removed as soon as they appeared. When these are matured, take them off, and if quite hard at the lower end, they may be potted immediately, and you begin the rotation again. When this routine was recommended in 1840, there were many who fancied it impossible, and when Mr. Marnock had to notice his correspondent, who followed it, he stated his objection strongly, but admitted that his objection did not apply to the small sorts, but to the Providence Enville, &c. However, in this, as in many other gardening matters, there are twenty ways of doing the same thing, and a lesson from any body that can accomplish the object is sure to be useful.

#### ON THE MANAGEMENT OF THE TURF OF PARKS, MEADOWS, AND GRASS PLATS.

It matters not, whether you intend to make a meadow, a pasture, or turf, for a pleasure-ground; if you attempt to do it with only one kind of grass, whether perennial or not, you cannot have a good thick sward.

For the first two objects (viz., meadow and pasture) I consider the greater number of sorts mixed together the better; only with this restriction, that it should be ascertained from experience which of the sorts is the most suitable for the soil, and that sort should, therefore, predominate, or a half or a third of it should be used, and the remainder composed of various other sorts; for example, Timothy-grass should predominate in a moist soil, rye-grass in stiff soils, yellow clover and French rye-grass in clay, honey-grass (*Holcus*) in light soils, and white clover on high lands.

It is very advantageous, if the spot where grass is to be sown should be dry, to trench it previously two feet deep, whatever kind of soil it may be, only the upper earth must be again brought to the surface, if the under stratum be not so good; if only sand, it should be improved by mud, compost, or field earth. If digging be found to be too expensive, the ground must be deeply ploughed twice, always supposing that the soil is sufficiently adhesive. When the ground is thus prepared, sow it thickly, in rather moist weather (the best time in Germany is from the middle of August to the middle of September), and roll it firmly in immediately afterwards. In stiff soils, the latter operation should be done on a dry day. About the end of October, the most beautiful green will be seen on the new meadow. Mow, the following

year, early in spring, in order to give it time to produce such another crop; then let the grass run to seed, and, by sowing itself, it will the next year be as thick as could be wished. It will now be only necessary to continue rolling it well every year, after every time it is mown, and every three or four years to give it a rich dunging with compost, field earth, mud, or new dung, whichever is the most easily procured. In this manner I have, to the astonishment of many farmers, obtained from light corn-fields the most luxuriant meadows, and which, contrary to all predictions, have for ten years continued to improve, and have amply repaid the outlay, as the profit gained in four years has equalled the capital spent on the land.

Marshy soil must first be drained in the English manner, by placing under ground gutter-tiles turned down on flat tiles, which will form a very strong small drain, and one that will not be easily stopped up, like those formed of sticks and stones. If there be a plentiful supply of water, and a sufficient fall to allow of its running off, rivulets might be formed, which would be a still better drain, and would have a most beautiful effect. They must, however, be very ingeniously contrived, so as to look natural, otherwise, they will rather disfigure than adorn. For such a rivulet I would recommend large and bold windings, with the bendings more pointed than round, and the edges as level as possible, so that the bank may not be so steep as to break down abruptly, and by that means loose the soil; and then, by removing the earth here and there from the bed of the stream, sometimes on one side, and sometimes on the other, and by planting bushes, and by adding stones and water plants, all the usual varied appearance of nature will be exhibited. In consequence of having too much stagnant water on a very uneven and large boggy meadow in my park, I thought of making a great many ditches, which have always a very disagreeable appearance; but the idea of a delta afterwards struck me, which I intend to execute according to the before-mentioned principle, viz., that of obtaining unity by means of multiplicity; while, by the aid of trees and shrubs, rushes, and other water-plants, and by enlivening the whole by different kinds of water-fowls, &c., I hope to produce an original, and, at the same time, quite a natural appearance.

It is easily understood that an irrigation or watering must be effected if possible; a complete flooding of the land during some days in spring, and every time the grass is mown, is much to be preferred to a slight watering every day during the scorching summer's sun, which I never found to be of much use.

If turf is wanted for a pleasure-ground or a garden, the different kinds of grass should be

mixed according to the quality of the soil, avoiding all the coarser grasses, such as *Holcus adoratus*, French rye grass, *Dactylus*, &c. English rye grass, *Festuca ovina*, and white clover, are the kinds generally employed in England; but to make the turf finer and better, instead of rye grass, several species of *Agrostis* and other fine grasses are used. In our soil and climate most beautiful thick turf can be made in a shorter time, by laying down turf cut carefully from the side of a field or forest. It is cut in long strips, and rolled up, then it is laid down on a well prepared soil, and beaten firmly down with a wooden club, any small species filled up with small pieces of turf, a little good garden earth strewed over it, then a little of the select mixture of grass seeds sown, and finally all well rolled and pressed in. This produces the desired effect with certainty; and should any part of the turf at a future time not thrive, I have always found it sufficient to take up that part, and supply its place by a part that is thriving; putting the bad part taken out where the good was taken from, and in a short time I have found that both became green again. The future treatment is, however, of the most consequence, and without that, no short turf can remain long beautiful. For instance, in wet weather, it must be mown every eight days, and in dry weather every 14 days, and quite as often rolled; and it is advisable to let the rolling precede the mowing. The first time, because it presses down the stones and little hillocks which interrupt the scythe; and the second time, because it removes the marks made by the first rolling, which look very ill for a few days, but entirely disappear after mowing. The common corn scythe is used for grass, but it requires great practice, and a very equal manner of applying it. All marks of the scythe must be avoided on grass borders by going over the same places twice. Early in the morning, in dry weather, when the dew is on the grass, is the best time for mowing. If these directions were followed, it would seldom be necessary to root out a single intruding flower or weed; they, on the contrary, soon die off, before they had time to disturb the smooth carpet's display. It is a prejudice that moss should be rooted out from such turf. Many kinds of moss under the shade of trees, where no grass will grow, form of themselves a kind of carpet, which is as soft as velvet, and nearly excels the turf itself in freshness. I remember seeing in the Isle of Wight an extensive track of boggy turf, which, in elasticity, brilliant green, and thickness, far exceeded all the lawns I saw in England; and I have succeeded in making many agreeable places of this kind under high trees.

Immediately after mowing, the very short cut grass (which is often only stubbly, is raked,

and then well swept and carried off, till the turf is as clean as a room. It is then more pleasant to walk upon than the best gravel path, and does not require the disagreeable prohibitions to be set up, which in our gardens have often degenerated into burlesque. In very dry weather I have often watered the pleasure ground by means of a large engine, while such heat and drought lasts, it is certainly better neither to mow nor roll. This circumstance excepted, the time of mowing and rolling should begin early in spring, and only end when the frost sets in. This plan, when long continued, is certainly very expensive, and therefore in many places in England it is often the custom only to mow a piece before the house, and the edges of the walks in the pleasure ground, particularly when the family are from home. The shortness and cleanness of the turf, however, I am quite convinced, suffer in future, if it is not continually mowed.

In large gardens it would be better if a select number of men were chosen to mow,\* and were directed to mow always early in the morning, so that when the last piece is finished, the first is ready to be begun again; by which means the greater part of the garden is kept clean.

It perhaps would be interesting, says the author of a work on *Landscape Gardening*, to the curious, to see the receipt which I wrote out for my head gardener for sowing meadows.†

"When I intend to make a meadow, I sow the field with turnips, carrots, &c., one or two years previously, and divide it into small allotments for the people, who have the produce for the manure and labour they bestow upon it; by which means the unevenness of the ridges greatly disappear, particularly when it is ploughed and harrowed across. This being done, the nature of the soil well ascertained, and as we seldom have a space of ten acres of equal goodness, I put lime and marl where the soil is light, and where it is heavy, I put sand and light field earth, and a compost of peat, earth, and tan, spread with a shovel equally all over the field, so that all cavities may be filled up, and the whole surface rendered so uniform, that it can be all equally rolled.

"I have always found the best time for sowing grass seeds is in August, or even September, if the weather permit; but August is ever preferable. The advantages of sowing at this time, are, first, because there is not the prospect of so much drought in autumn as in spring,

\* It is much to be recommended that workmen should be kept at one kind of labour as much as possible; they will do it better, in a shorter time, and with more pleasure.

† Rehder, Stutgard.



and by that means the grass begins to grow, and becomes strong before winter; second, because meadows sown in autumn produce much better seed, and in greater abundance; and third, because the field can then be prepared at leisure, when the spring labour and other pressing works are finished, and men and cattle have then the most time and best opportunity to level and improve the soil.

"As labour is not very high here, I generally have the ground intended for a meadow dug up in the month of July, by the square rod. When rainy weather sets in, and the clods are about half wet through, so that the soil does not stick too much together, I harrow it once, and then sow the following mixture of grasses:—English rye grass, French rye grass, *Dactylis*, *Festuca protensis*, *Holcus odoratus*, and Timothy grass, at the rate of half a hundred weight of pure seed to a Magdeburg acre. The seed saved at home is generally not very clean, because it is so troublesome to gather it; and therefore in that case double the quantity would be necessary, and in light soils three times the quantity must be used. Timothy grass does not mix well with other seeds, on account of its small heavy grain; therefore I take ten pounds of this seed, one pound of white clover, one pound of red ditto, one pound of yellow hop clover, and one pound of yellow melilote, and sow this mixture over the already sown lighter seeds, all the other seeds being heavy. The whole is then well rolled lengthwise and across.

"The following summer, when the greater part of the seed is ripe, before I mow it, I have it beaten with rakes or small flails. This shakes out the ripe seed, and in favourable weather the greater part of the fallen seed springs up, from which I have in the same year a tolerably thick turf, which I could not expect from a meadow sown in the usual way for several years, unless I were to sow it three times thicker than I have stated, which would be very expensive. The reaping the seed, and the threshing are very troublesome, and so much depends on the state of the weather."

#### MR. M'EVoy's CULTURE OF THE COCKSCOMB.

MR. M'EVoy was one of Mr. Marnock's best contributors to his sound little work on Floriculture, and perhaps one of the best exhibitors of this rich and curious plant. His method should be known to everybody, and when made known through our columns, it will be pretty nearly. He says, sow the seed in shallow pans, in equal portions of leaf mould and silver sand. When the plants have six leaves, pot them single into No. 60 pots, in equal parts of light loam, leaf mould, and sand. Place

the pots in a strong moist hot-bed, say 80 deg., and within a few inches of the glass. In very strong sunshine they will require partial shading: but at all other times full exposure to light. When the roots protrude through the bottom of the pots, I take the plants to a close shed or house, when I carefully shake the soil from the roots, but preserve, with great care, every fibre. I re-pot in clean No. 60 pots, in light sandy loam; if the loam be not naturally sandy, I add a small portion (one-eighth). I give no water, but replace them immediately in the hot bed, and if the sun shines, shade with a thin mat. In a day or two, if the soil is very dry, I give a little water. When the roots again get through the bottom of the pots, I shake the soil carefully from the roots as before. If the roots will not again fit in the No. 60 pots, without crushing them, in that case I re-pot the largest plants in small No. 48's in the same sort of soil, and replace them in the hot-bed as before. By the time the roots again fill the pots, each plant will be showing its crest. I then carefully select such as I consider will make handsome flowers. All frothy heads I reject, selecting such as make a conglomerated tortuous head, with perfect foliage, and with fine velvety hue; this process I call dwarfing. If I can get a sort remarkable for colour, I care not whether the seed is from plants of one or three feet high. The selected plants I carefully shift, not shaking the loamy soil from the root as before. My reason for not doing so this time is this:—Having gained the object in view, or the protrusion of flower heads, I consider the poor loamy soil in close contact with the stem of the plant essential to it, for as the plant extends its stem above ground, so also do the spongioles or feeders extend beneath the soil in search of new aliment; and with as much reason might we place food at the pole of a sick man's neck and invite him to eat, as to put rich soil where there are few feeders, and these few with little power of absorption. I have also observed, when Cockscombs get injured from burning, or other causes that they emit new roots into the loamy soil; whereas in a highly manured soil, in close contact with the stem, I could not perceive this to be the case. Indeed I have submitted plants to injury, with the view of experiment, merely to satisfy my mind on this head. The selected plants should be shifted, as often as they fill the pots with roots, in this compost—one half rich pasture loam, and equal parts of rotten hot bed dung, leaf mould and sand. From various experiments, I prefer this to all others I have used. I give ample drainage, with broken potsherds, over which I lay pieces of turfy loam, through which the roots pass freely. From various experi-

ments, I am of opinion that Coxcombs can be grown to greater perfection with bottom heat than without it: from 80 deg. to 85 deg. I find the safest maximum. Under each pot, in the tan, I put a piece of slate, to prevent worms from entering the drainage hole. After repeated trials with various liquid manures, I prefer that from sheep's or deer's dung to all others. Before use, we ferment the dung by steeping it in soft water, placed in a vessel over a hot part of the flue, by which the minute globules are dissolved. The liquid, when drawn off, is of the colour of brewers' ale; this is used two or three times a week. I frequently put three oz. of nitre in four gallons of this liquid. On the evening of every hot day, I sprinkle the plants over head with clean warm water of about 70 deg. Near two hours before the sun leaves the hotbed, when the thermometer indicates 100 degrees, the effect on the plants is truly surprising. Here we appropriate a large three-light frame to the growing of Coxcombs; and as the plants increase in size, we remove the worst of them, at each shifting, to some of the hothouses, until finally about three dozen remain in the frame, which are intended to be brought to perfection for exhibition. In 1838 we had them good. The tallest one in the frame was 12 inches high from the pot, 31 inches and a half along the crest, and 14 inches and a half across the crest, with foliage almost enveloping the rim of the pot. The least flower in the frame was 26 inches long. Coxcombs are much admired in this neighbourhood, and indeed by several gardeners they are very splendidly grown. I hope I shall not be considered egotistical when I say, we are sometimes successful in exhibition. The linings should be kept up, so as to command a strong moist heat, having taken care that the noxious effluvia does not enter the frame, or the destruction of the plants will be the result. When plants are wanted in perfection in June, seed should be sown in the early part of February; when wanted in July and August, seed to be sown about the middle of March; when wanted in September and October, seed should be sown from the first to the middle of April. At all seasons the hotbed should be matted every night. I may also mention, I got plants not more than three inches high by the following method:—After the crest is well formed, the flowering part is severed at any desired length from the stem, and as no new leaves will afterwards be formed, it is desirable to remove only so many as will admit of the stem being inserted one inch deep in sandy loam in small No. 60 pots. Each cutting should have a little water, and be plunged in the bark, covered with a cutting glass, and shaded from the sun. When the pot is filled with roots, each plant

should be shifted into larger pots, in the soil mentioned for the old plants; of course it cannot be expected that they will make large plants, yet to the curious they will be interesting. I should also add, after the plants are finally established in large pots, all green incrustations should be removed from the surface, the surface soil to be replaced by fresh soil, and to continue at all times at a strong moist heat.—

It is a plant that we have not seen grown to perfection lately, and we trust the publication of this paper, and the recollection of Mr. M' Evoy's specimens, will induce a few to try it, although the exclusion of the flower from certain horticultural exhibitions may be somewhat discouraging. The public always took a great interest in finely grown plants, and they will always be acceptable at meetings where the skill of the gardener is to be recognised.

#### TULIPS IN HOLLAND.

HAARLEM is thirty-six miles from Rotterdam, and is the garden of Holland. The soil on the New Port side is a dark, sandy, heath-coloured soil, such as is used for Ericas, full of silvery shining particles; and on the Blooming Dale side it cannot be called anything else but sand, such as would be used in England for building purposes. The gardens in this neighbourhood adjoin the ridge of sand-hills called the Downs, which serve as a barrier to the sea, and were left years ago when the sea receded to some distance. I understand that the sea is nearly two miles from these hills. On the Palace side (I believe it is called Dordt Straat,) it is a little better. The gardens are, from the flatness of the country, intersected by dykes, which run from the canals, and serve in some instances to convey manure in small boats to the land. This filters through the porous sandy soil, and serves to nourish the bulbs, so that they may be said to grow in soil and water. It is impossible for almost any country to equal them in bulbs. Nature combined with art has done much for them.

The Hyacinth ground is prepared some months previous to planting, and from what I saw, I should say they put two-thirds cow-dung into the soil (if it may be so called). All flower-gardens are manured in like manner, cow-dung being plentiful.

It is a mistaken idea that the Dutch are great admirers of flowers. This I do not consider to be the case, as they do not in the least seem inclined to purchase new varieties at all from England. The answer they make is, "we cannot sell to Englishmen." Their trade is a mere matter with them of pounds, shillings, and pence. Any one presuming that they are extensive raisers of Tulips will be much disap-

pointed; I did not see a single seedling coming to maturity. All they had in the way of breeders were blooming roots, and but few good ones were to be seen. With Hyacinths it is far different; the little as well as the large cultivator devote a plot of ground to seedlings, and a considerable quantity of seed is annually sown. The seedling as well as the blooming roots of Hyacinths are generally grown in beds of thirty to one hundred yards long. One florist told me of one who had no less than sixty thousand large and small roots of the Bouquet tendre, or Waterloo. The reason is plain: Hyacinths, &c., are in demand, whilst Tulips are not so; so that they pay particular attention only to that which is likely to produce most money.

Each variety of Tulips is grown together in beds of twelve to fifteen yards long, and of some varieties (Ambassador d'Hollande particularly) it is not uncommon to see a large bed of them containing at least one thousand bulbs, all in fine condition, and of the best strain.

There are few beds protected as they are in England. I only saw four, and one of them contained a great number of common flowers, such as Surpasse la Cantique, whilst the same individual had very fine varieties growing in various beds unprotected.

The Dutch are principally indebted to their neighbours for the fine sorts they possess. They are not on the most friendly terms with each other, and will not introduce you to any other collection, unless it happens to belong to a relative or intimate friend, who has what the other does not possess; and after you have made your selection from the previous one.—*Letter of Mr. Slater (Manchester), abridged.*

#### THE CULTIVATION OF CELERY.

Now that we see prizes of five guineas offered for the best three or four heads of Celery, and none to be considered heads under a given weight, we can hardly afford too much information on the different modes of cultivating it adopted by various persons, especially those who have succeeded well in the attainment of the desired quality. Mr. Towers, the author of the *Domestic Gardeners' Manual*, has taken some pains to lay open the whole art and mystery of this branch of culture. There is nothing, perhaps, more desirable than reducing the numerous writers as to quantity, and giving the spirit of their notions. To the concentration and abridgment of such matters, we plead guilty, and so that we give each credit for his share, the public are gainers, and nobody losers.

The essential generic character of the genus *Apium*, is, according to the *English Flora*:—"Fruit, roundish ovate, with six acute dorsal

ribs: interstices flat. Calyx, obsolete. Petals, roundish, with an inflexed point, very nearly equal. Styles, greatly swelled at the base. Floral receptacle, thin, orbicular, wavy. Flowers, nearly regular, united."

The native wild Celery is found in ditches and marshy ground, especially towards the sea coast. It is biennial, and flowers in August and September; the flowers are small, numerous, greenish white; the apex of each petal inflexed, that is, bent inward, with a small curl towards the centre of the flower. "The seeds, and whole plants, in its native ditches, are acrid and dangerous, with a peculiar strong taste and smell. By culture it becomes the mild and grateful garden Celery, for which, and its name, we are indebted to the Italians."—*Smith's Flora, Art. Apium.*

*Sweet apium, or Celery*, has upright radical leaves, on long fleshy foot-stalks, with the folioles five lobed. Its varieties, according to Abercrombie, are:—

*Common upright hollow Celery*; foot-stalks of the leaves hollow; one variety is white, another red.

*Giant upright Celery*; large.

*Upright solid Celery*; having the foot-stalks of the leaves solid.

*Turnip-rooted Celery, or celeriac*; with a large turnip-shaped root, and spreading leaves.

*Use.*—The leaf-stalks, when blanched, are used raw as a salad; they are in season from August, sometimes from July, to March in the following year; they are used also to flavour soups, and sometimes are boiled as a dinner vegetable. Loudon says, "in Italy, the unblanched leaves are used in soups; and when neither the blanched nor the green leaves can be had, the seeds, bruised, form a good substitute. The root only of the variety called celeriac is used; and Sabine informs us (*Hort. Trans.*, vol. iii.), "it is excellent in soups, in which, whether white or brown, slices of it are used as ingredients, and readily impart their flavour. With the Germans it is also a common salad, for which the roots are prepared by boiling, until a fork will pass easily through them; after they are boiled, and become cold, they are eaten with oil and vinegar. They are also sometimes served up at table, stewed with rich sauces. In all cases, before they are boiled, the root, and the fibres of the root, which are very strong, are cut away, and the root is put in cold water on the fire, not in water previously boiling."—(*Encyc.* 3998.)

*Propagation.*—All the varieties are raised from seed, of which half an ounce is considered sufficient for a bed four feet and a half wide, by ten feet in length, for the upright sorts. I shall first describe the mode of culture recommended by Abercrombie, and then that prac-

tised by Judd, first premising that Celery delights in a good rich soil, not manured with rank dung, but with vegetable compost; the ground should be deeply trenched, made light, free from stones, and then be well incorporated with the manure. As in its native state, it is found in moist places, it is very probable that, in the general mode of culture, Celery does not receive one half of the water which it requires. I have not witnessed the practice of floating, but it would be well worth while to compare the results of two trenches in the same soil and aspect, one being floated to saturation during dry weather, the other treated in the ordinary manner. I would suggest that an ounce or two of common salt be dissolved in three gallons of soft water, and poured in the watered trench twice a week. It has been said above, that Celery affects spots near the sea; therefore salt may be useful to it. I employ salt continually in the garden, and I believe with good effect.—*Towers*.

#### ABERCROMBIE'S METHOD OF CULTURE AB- BREViated.

*Sowing*.—Celery is propagated by seed sowed annually in the spring at two or three different times, to continue a regular succession from June, July, or August, till May, performing the first sowing early in March in a slender hotbed, or warm sheltered border. Bury the seed very lightly, either by covering it with fine earth, or by raking it in moderately. A second sowing for the main crops may be made towards the end of March, or the beginning of April, in an open bed, and a later sowing about the end of April, or early in May. All the plants of each sowing are to be transplanted.

*Planting out*.—When the young plants attain the height of two or three inches, raise some of the best, and prick them out into nursery-beds to obtain strength. A few of the earliest may go into a moderate hotbed, at two or three inches distance, to forward them, the others into the natural ground, in beds four feet wide, the rows six inches asunder, and plants six inches apart in the rows. Give water, and let them grow about six weeks before final transplantation. Those remaining in the seed-bed will grow stronger, and afford two or three drawings to prick out as above, or to plant at once into trenches.

*Removing into Trenches*.—As the plants advance from six to eight, or from ten to twelve inches high, they are to be transplanted into trenches, and the season for this work extends from June to October. Choose an open compartment of rich ground, clear it from weeds, mark out the trenches by the line and spade, a foot wide, and three or more feet asunder.

Dig out the cavity, making each trench a moderate spade's depth, laying the spits of earth alternately to the right and left on the wide spaces between, making it even; dig the bottom of the trenches lightly, and if the ground be poor, apply some rotten dung, and then dig the bottom. Then draw up a quantity of the stoutest plants, trim their straggling tops and long roots, and plant them by dibble in a single row along the middle of the bottom of each trench, four or five inches asunder; giving directly a good watering, and repeating it occasionally in dry weather, till the plants take root.—Plant out successional crops every two or three weeks.

*Future Culture*.—The chief care required is to hoe up weeds, and earth up the plants by degrees, beginning the first earthings when the celery in the trenches has grown to the height of eight or ten inches. With a hoe or spade, turn the earth lightly to each side of the rows of plants, about three or four inches high, according to their size, and repeat the earthings with a spade every week, fortnight, or three weeks, as the celery advances in growth: using the earth that was thrown out of the trenches first, then that of the spaces between, till by degrees the plants are "landed" from twelve to twenty inches, or two feet high, according to the growth or variety, being careful, however, that the winter crops are landed well up near the tops in October or November.

*Taking the Crop*.—Some of the earliest plants will be blanched a little, and fit to take up, by the middle or end of June and July; but the main crops will not be blanched till August, and will be in great perfection in September and October, continuing, in the succession crops, throughout the winter. The latest crops for spring use, planted out in September or October, &c., require but shallow trenches five or six inches deep. The ground for these crops may be previously digged, and *drill* trenches formed with the line and hoe for the reception of the plants.—(From the *Pocket Dictionary*, Art. Apium).

#### JUDD'S METHOD OF CULTURE.

*Sowing*.—He sows about the middle of January, in a warm situation, on very rich ground, protecting it by mats at night. When the plants are from two to three inches high, he pricks out into a nursery-bed, immersing the plants as he draws them in water, so as they may remain moist while out of ground. The plants remain in the nursery-bed till they become "very strong."—(*Hort. Trans.*, vol. ii.)

*Transplanting*.—Judd prepares his ground for transplanting, by trenching it two spades deep, mixing with it in the operation, a good

dressings of well-reduced dung from the old forming beds. He says, "I give it a second trenching, that the dung may the better be incorporated with the mould, and then leave it in as rough a state as possible, till my plants are ready to put out. In the ground thus prepared, I form trenches twenty inches wide, and six inches deep, at six feet distance from each other, measuring from the centre of each trench. Before planting, I reduce the depth of the trenches to three inches, by digging in sufficient dung to fill them up so much. At the time of planting, if the weather be dry, the trenches are well watered in the morning, and the plants are put in, six inches apart in the row, in the evening, care being taken, by the mode above-mentioned, to keep the fibres quite wet whilst out of ground. As they are drawn from the nursery-bed, the plants are dressed for planting, and then laid regularly in the garden-pan. The trenches in which my rows of celery are planted being so very shallow, the roots of the plants grow nearly on a level with the surface of the ground; this I consider particularly advantageous, for as considerable cavities are necessarily formed on each side when the moulding takes place, all injury from stagnant water or excess of moisture is prevented. The trenches, when planted are watered as may be required." He adds, "that he prepares his ground for celery during the winter, and avoids putting much of a crop in the space between the trenches, especially one that grows tall, as he finds celery does best when it grows as open as possible."

**Future Culture.**—In "landing" or earthing up, Judd does "not think it well to load the plants with too much mould at first; the two first mouldings therefore are done very sparingly, and only with the common draw-hoe, forming a ridge on each side of the row, and leaving the plants in a hollow to receive the full benefit of the rain and waterings. When the plants are strong enough to bear six inches height of mould, the moulding is done with the spade, taking care to leave basis enough to support the mass of mould which will ultimately be used in the ridge, and still keeping for some time the plants in a hollow, as before directed. The process of moulding is continued through the autumn, gradually diminishing the breadth of the top, until at last it is drawn to as sharp a ridge as possible, to stand the winter. In the operation of moulding it is necessary, in order to prevent the mould from falling into the heart of the plant, to keep the outer leaves as close as possible; for this purpose, before I begin the moulding, I take long strands of bass matting, tied together till of sufficient length to answer for an entire row, and I fasten this string to the first plant in the

row, then pass it to the next plant, giving it one twist round the leaves, and so on, till I reach the other end, where it is again fastened; when the moulding is finished, the string is easily unravelled by beginning to untwist it at the end where it was last fastened."—*Ency. of Gard.*, 4006, &c.

Mr. Towers says, "as Celery seed lies long in the ground, and is very tardy in its early growth, it will sometimes be advisable to make use of artificial heat for the earliest crop. The hot-bed need not be made of dung alone; tree-leaves mixed with it, or with mowings of grass or nettles, are excellent substitutes. It may be constructed in any sheltered spot of ground, three feet wide, four feet long, and two feet high. Place four broad boards on the sides of the base, in order to preserve the square form of the bed, or lay a close lining of long littery manure on each of the sides. Cover the surface with a stratum of fine rich earth, six inches in depth; place upon it a common open frame, made by nailing four boards together; and when the heat rises gently, but regularly, sow the seed evenly, and not thickly, over the bed, then sift over it a quarter of an inch of light soil. At night protect by double mats, and thus a fortnight or more may be gained. Some, as fine plants as ever I saw, grew on my asparagus bed,—and from self-sown seed. A stray Celery plant having seeded near the bed, a few seeds had fallen, and, as I conjecture, had been scattered by the wind over its surface. Be this as it may, the means of sowing were unknown at the time, but the results in the following spring were a set of clean, well-grown Celery plants, which went at once into trenches, without any intermediate nursing.

I mention the fact, not by any means to recommend the practice of sowing on asparagus beds, but as a hint, that if a spot of well-protected, yet open ground, were prepared in the autumn, and the surface, after being smoothed and levelled, were sown moderately close in November, covered first with a quarter or half an inch of sifted soil, and then with littery manure, to the depth of four inches, a crop of fine plants might be anticipated early in the spring. It would, as in the case of asparagus, be requisite to rake off the litter as soon as the frosts appear to have finally ameliorated; and it must always be deemed an indispensable proviso, that the seed be sown so late in the season as to leave no chance of its germinating before the frost sets in. Under ground the seed would be as secure as in a drawer; but if the plant should rise above the surface, the first hint of a frost would cause the destruction of the whole. When the young plants emerge, they should be protected by a covering of mats placed over hoops.

To secure success in the trenches, the ground ought to be extensively manured. Gardeners are apt to confine the enrichment merely to the bottoms of the trenches; the consequence is, that when the roots extend beyond six or eight inches on each side, they run into ground far less abundant in decomposable nutritive matters; Judd's method of previous preparation is, therefore, highly to be commended.

Skill is required to perform the trenching in a workman-like manner. In order to begin the work well, the ground should be trodden to a pretty firm state; then two lines are to be strained very tight along the space to be trenched out, at the required distances apart—say, of from twelve to eighteen inches. The spade is to be placed close by one of the lines, with its back inwards, and pressed perpendicularly down, if the ground be of a binding quality, or with a slight inclination outwards, if it be of a light, crumbling nature. The spade is to be thrust as deep as it will go, and if, on withdrawing it, it does not come up clear from earth, the edges of the trench will be ragged; therefore, to obviate this, it will be advisable to dip the spade in a pail of water before pressing it down. Thus proceeding along one line, and then returning by the other, the ground will be marked out, and will “lift” without much trouble, leaving the sides even, or so nearly even, that they may be readily finished off.

I have grown excellent celery in mere drill trenches, made by the line with a draw-hoe; there is, however, I think, more trouble in earthing up, when the plants are so near the surface.

At the time of planting out, either into nursery beds, or trenches, all the little offsets or suckers that emerge from the collar of the root should be stripped off.

*I object (says Mr. Towers,) to trimming the tops of the leaves—a practice which is usually recommended at the period of final removal, on the ground “that the old leaves always die and decay.”* They may die, it is true, if much violence be used in pulling up the plants, but the amputation of the leaflets will not by any means prevent their death. I assert, however, that the leaves may be preserved, if the plants be carefully eased out of the beds by a trowel, and immediately placed in water, as practised by Judd; and if they are of real utility in vegetation, the excision of one single leaf, is the loss of an important and vital organ. A row of nicely-trimmed plants presents, I grant, a neater appearance for a few days, but there the advantage ceases—for the untrimmed plant will stand erect and be growing, by the time that the putrescence of the shortened foot-stalks is in full progress; in the former, the proper juice will be elaborated and duly distributed,

while, in the latter, new parts must be developed, before the principles of growth and strength can come into active operation.

In *earthing up*, a dry day, and a dry state of the upper soil, should be preferred. The edges of the trench are to be first cut by the spade, an inch at a time, with the utmost nicety—the soil will fall into the trench, but is not to be drawn to the plants till they have been secured by tying. I prefer a soft twisted string for this work, because, by measuring the length of the trench, and allowing about three inches for the turn that is to be taken round each plant, a string of the proper length, without a single knot in it can easily be prepared—and this is an advantage, as it obviates the inconvenience resulting from the knots in the *bass line* employed by Judd. I also tie one end of the string to a small stick, and thrust the stick into the soil, a little beyond one of the plants, at either end of the trench; this secures the plants, keeps them firm and upright, and does not permit the string to come off; the work is finished by tying the line to another stick at the opposite end of the trench. If no string or bass be used, the leaves and stalks of each plant must be held together by the left hand, while the earth is brought round it with a hand-hoe, or garden trowel.

In the subsequent earthings up, particularly when the plants become tall, a pair of long strips of inch boards may be placed, one on each side of the leaves, as high as the earth is to be carried up; to be secured in their situation, by two pointed sticks, thrust into the soil at each end; the strips will be pressed firmly against the leaves, and keep them in a proper position. One man may thus ridge up a row of plants with great precision; but this work is always better performed by two men. The strips should be kept ready for the purpose; they may be from twelve to fourteen feet long.

*Protection during Winter.*—Frost and snow, generally speaking, will not do much injury; but alternations of frost, sunshine, and rain, will cause the plants to decay at the heart; therefore it is always prudent, previous to the approach of settled frost, to arch over the trenches with hoops, and cover them with mats; or, what is better, to fix two boards in the form of a ridge or roof, so that the rain may shoot off the two sides. Whatever covering is used during settled frost, it must not be removed till the ground become perfectly tractable under the spade. A dozen or two of the finest plants ought always to be taken up before the setting in of a frost, and preserved in dry sand, in a cellar or warm shed—for it is impossible to dig up celery, when the ground is hard frozen, without doing much injury to the blanched leafstalks. In the severe season of 1838, the

rows of celery were destroyed almost to a plant; this indicates precaution.

#### CULTURE OF CELERIAC, OR TURNIP-ROOTED CELERY.

*According to Abercrombie*.—It is propagated by seed, sowed in March or April, in beds of common earth, for transplantation, thinning the young plants to three inches, and when four or five high, plant them out in a plot of digged ground, in drills drawn by a hoe, three or four inches deep, by two feet asunder, in which set the plants in a row, six inches apart, and water them.

Then, when they are advanced in growth, and the root swelling, earth them up once or twice, four or five inches high, which will improve the roots, render them white, tender, and fit for use in three or four weeks after being earthed.—(*Pocket Dict.*—*Apium*.)

According to Sabine:—"The times of sowing are the same as for the other sorts. Celeriac requires a rich soil, and the plants are raised on a hotbed under glass, and transplanted when two or three inches high, to another hotbed, and set one inch and a half apart. In the beginning or middle of June, they are transplanted into a flat bed in the open air, at the distance of fifteen inches from each other, and not in trenches, like other celery. They must be abundantly watered as soon as they are set out, and the watering must be repeated every other day, or if the weather should be warm, every day. As they increase in size, they will require a greater quantity of water, and they must be occasionally hoed; the roots will be fit for use 'in September or October.' In a note to this paper, Sabine states, that he has been informed that the plan of giving excess of water is peculiar, and that the vigorous growth of the plant is more dependent on richness of soil than on other causes."—(*Encyc. of Gard.* 4017—from *Hort. Transactions*, iii.)

Celeriac seed, when purchased, cannot at all times be trusted. Until 1831, when a friend gave me a packet, procured at Boulogne, under the title of *celeri-rave*, I never obtained celeriac. This seed was sown in a shallow drill (though a hotbed would have been better), and the young plants were removed to nursery-rows, richly manured. They retained every appearance of celery till their final removal; when, being planted fifteen inches asunder, the leaves took a horizontal direction, without clongating.

The roots are in season according to the treatment they receive, from September till January; they are rough, knobby processes, covered with fibres. I did not perceive that excess of watering was required.

*To save Celery Seed*.—Select one or two fine

plants, conveniently situated, and leave them to go to flower and ripen their seeds. Sometimes the plants will require the support of a stake, if they be exposed to the influence of winds. The seed, when perfectly ripened, will retain its vegetative power for three or more years; it should be kept very dry, however; it is highly aromatic.—TOWERS.

By attending to the instructions, which contain pretty nearly all that need be said of this useful salad, a novice may insure good Celery with only moderate labour and pains, and those who have grown it for years may learn something. It would be well if many other subjects, in the growth of which, particular gardeners excel, were made as familiar by the circulation of all that is of importance among the writings of the chief cultivators. No man has done more than Mr. Towers in matters of this sort, as his admirable *Kitchen Gardener's Book*, *The Domestic Gardener's Manual* will show at a glance.

#### FORCING THE CUCUMBER.

SIR,—It is the ambition of most gardeners to excel each other in the produce of early Cucumbers, and various are the methods pursued to obtain that end, some preferring the old system of Abercrombie, others McPhale, Nicol, Loudon, &c. &c., all equally good to the practical man, or equally bad in the hands of the theorist. Nothing can be done in the forcing department with any degree of success without practice. It must not, therefore, be expected that I shall be able to point out a better mode of cultivation than has already appeared from abler pens than mine, my only object being to lay before your readers my method of culture upon what is termed dung beds, without the aid of hot-water pipes or flued pits. Still I have been able to supply the family I have the honour to serve with fruit of no ordinary quality for eleven months in the year, and this too for a long succession of years.

I shall now, in as brief a manner as I am able, point out the method I usually pursue, the time of raising my plants, the materials my beds consist of, the compost I consider most suitable for winter work, &c. The time of sowing your seed for early produce I consider a most essential point, therefore I invariably put a few seeds in on the 1st or 2nd of October. Plants raised at this season grow more robust than when raised at a later period, and are less succulent and far better able to bear the vicissitudes of the winter months; and for this purpose I make up a slight hod-bed for a one-light box the last week in September. I pot off my plants when fit, singly into small sized pots filled with rich leaf mould. I stop at the first

joint, and as the plants advance I shift them into larger sized pots. I am enabled to keep my plants in the seed bed till the middle or end of November, with the assistance of slight linings of horse-dung; and at that season I have a bed prepared to receive them for their winter quarters. Therefore, at that season I have collected together all the rubbish of a fermenting quality from the kitchen and pleasure-gardens, with a portion of stable-dung, a few cart loads of tanner's bark, and a good supply of fresh gathered leaves. Of such materials the bottom stratum of my beds consist, to the height of four feet, upon which I place brushwood faggots, cut and bound for the purpose a foot and a half long, and ten inches through; a single row of these faggots I place along the centre of the bed, with an additional faggot to each light, back and front, the wood being well trodden down, taking care that the faggots do not project over the sides of the bed; upon this stratum of wood I place a foot and a half of well-prepared horse-dung and leaves well mixed together, and well beaten down with the fork, upon which surface my box or boxes are lifted, the lights closed till the bed is in a complete state of fermentation, when the lights are pushed down a part, and remain night and day, till the rank vapour has subsided, and the heat becomes sweet and wholesome to the nose, after which the box is lifted from off the bed, and properly arranged to receive the compost. I do not hesitate in saying beds made with such materials are preferable to those made entirely of horse-dung. My boxes are about thirty inches deep in the back and fifteen in front, and I generally raise the back of the bed higher than the front by eight or ten inches, removing the dung from the centre to admit of at least two wheel-barrow full of road dirt to each light to prevent the steam from arising too rank from the wood fires.

Cucumbers will grow in almost any soil that is necessary for winter use, to make use of loam that is rich and light, so that the moisture may pass off quickly without injury to the roots of the plants, and I know of none better calculated for that purpose than what is termed bog or heath mould. I have myself obtained, from Sydenham-common, a soil of that nature that had every quality requisite for the purpose, but for many years past I have been obliged to substitute for that article, a compost which consists of two-thirds leaf mould, with one-third the sweepings of the street, or the sides of the high road. This soil appears to me to possess every requisite. Of such compost I form my hills, in the middle of each light, ten, or twelve inches deep, and the next day ridge out my plants in the usual way, ex-

cept that I never allow more than one or two plants to each light. I line my beds slightly and early, that is to prevent the heat from evaporating from the sides of the bed where the wood is placed. My lining consists of horse-litter and leaves, which I increase in size and strength, according to the weather and season, endeavouring to keep up a brisk lively heat, say from seventy to eighty degrees. I seldom make use of a thermometer; from long practice I can tell within a few degrees, immediately I lift a light from the box: the very sight of the plants is a sufficiency to a practical man whether the heat is too much or too little. I stop my plants at every joint, and earth them up by degrees, as the plants advance in root and branch. I keep my plants ten inches from the glass; never peg them down for the purpose of rooting: arrange the laterals eight or ten inches asunder; seldom shade, except the plants are heavily fruited and a very powerful sun. I consider that if your plants require much shading they are not in a healthy state, and you had better pull them up and replace them with some more healthy. I am lavish with air, night and day, and water frequently over head. Seldom chill the water, except in a frost. I consider a foot of soil sufficient for a Cucumber plant to produce fine fruit, although I have known them penetrate three feet down in an open soil.—*W. G., Castle R.*



LILIUM THUNBERGIANUM.

THIS is one of the numerous varieties and species of the Japan Lily, and was introduced in the year 1835. It is orange and scarlet, richly speckled, blooming in July, and requiring some protection, though like many of the plants of Japan, a frame is enough. It is almost impossible to do justice to this magnificent and extensive tribe or family. The Li-



*lium Japonicum* has been grown very extensively by Mr. Groom of Clapham, who has more perhaps than any other nurseryman; he considers that it is pretty nearly, if not quite, hardy, but it contrasts beautifully, as do almost all the White Lily tribe, with the beautiful species under notice.

#### LEGUMINOUS PLANTS.

FROM the earliest period of history, or even of tradition, the seeds of a tribe of plants, known by the name of *pulse*, had been used as food. It was derived from the Latin word *puls*, signifying a kind of gruel or thin pudding; although others suppose it to be derived from the Hebrew word *ful*, signifying a bean. Beans were employed at a very early period as food, and the bean and pea constitute the type of a very large order, containing at least one-tenth part of the whole flowering plants. They derive the term *leguminosæ* from the character of the seed vessel, vulgarly called a pod, but by botanists a legume. The individuals of the class differ greatly from a diminutive vegetable to trees of the largest kind. Amongst other peculiarities they are remarkably susceptible to changes of temperature, there being a great tendency to vary in the leaves, not so much seen now as in the summer, and producing an inclination which is called the sleep of plants. An instance of this is afforded in the common clover of a summer's evening, which by daylight is expanded by the sun, whilst at night the stem is drawn back. By De Candolle, and the French botanists, they have been divided into two great divisions from the embryo of the seed: the first being called the curved embryo, and the other the erect embryo; the former bending upwards as in the Tonca bean. These primary divisions are separated into two tribes, or sub-orders: the first containing the Papilionaceæ and the Schwartzi; the one being named from the resemblance of its flowers to that of a butterfly, and the other from a celebrated Dutch botanist. These classifications not only assist the botanist, but in some measure show the properties of the varieties. The Papilionaceæ are the most numerous of the class, and their characters the most diversified. The old botanists considered that the farinaceous seeds formed food for man, and herbage for cattle, and that none of them were poisonous. To the latter there are, however, many exceptions, but with many it is doubtful if they do not possess more nutritive qualities than grain. In fact beans contain 14lb. and peas 20lb. more flour per cent. than oats, and at least three-fourths of the weight of this flour consists of starch. A variety of pulse, called lentils, is still more nutritious than either,

and an instance of its antiquity is given in the Bible, where it formed the red pottage for which Esau sold his birthright. These are imported in considerable quantities into this country for cooks, by whom they are used for giving colour and texture to soups. Much of the food used for agricultural purposes, as clover, fescue, tare, saintfoin, &c., belong to this class; but others, as the laburnum, and other species of *cytissus*, are more or less poisonous, which is owing to a peculiar principle called by chemists *cytisine*. The flowers of the laburnum are poisonous, and the young shoots are cathartic. The rule of old botanists might almost be reversed; but although many varieties are poisonous, this does not detract from their utility. Many of their productions are of great commercial importance, both in medicine and the arts. From a pea-plant (*Glycyrrhiza glabra*) is obtained the inspissated juice called liquorice. Mannah is the production of another species common to Persia and Tartary; and gum-tragacanth is obtained from another called the milk-vetch. Dragon's-blood and kino, celebrated for their astringency, and their value in dyeing, are the products of others; as also the red and yellow sanders-wood. Gum-lac is obtained from a species of *cutea* in the East Indies; and indigo is the produce of several species of *indigofera*. Soy, from which the celebrated sauce is named, the product of the seeds of a species of *dolichos*. There are many others which comprise valuable timber, medicine, and food.

#### INJURIOUS INSECTS.—NO. IV.

Wire-worm Beetles (*Hemirhipus lineatus*, et *H. obscurus*).

THESE beetles may be known by their long flattish bodies, and their remarkable habits of pretending to be dead for a moment when touched, and then suddenly jumping up into the air with a clicking noise.

The grubs of these beetles are commonly called wire-worms. They are of a long, thin, flat, and jointed form, and of a whitish colour. They have two breathing spiracles on the back of the last joint. The grubs live five years before they change to beetles, and during that time they commit such extensive ravages that they often destroy whole crops of grain and vegetables, feeding chiefly on the roots of wheat, barley, rye, oats, grass, potatoes, carrots, and salads. They are most abundant on light soils, and on grounds just converted into meadow-land. Spence says, they are particularly destructive in gardens which are formed upon what was occasionally pasture land. In 1813, they destroyed a great proportion of the annuals in the Hull Botanic Garden, which is formed upon land that was formerly pasture land.

Sir Joseph Banks recommended slices of potato stuck upon skewers to be buried near the newly-sown seed, and examined every day, when the wire-worms, which collect upon them in great numbers, should be destroyed. But it is said to be much more advantageous merely to lay the slices of potato upon the surface of the ground they infect, and to examine these every morning. A writer in the *Lincoln Gazette* recommends white mercury, or corrosive sublimate, as a protection against their devastations, and mentions the circumstance of a large crop of oats having been saved by about eight pounds weight of it being scattered over the field.

*The Brown-tail Moth (Porthesia auriflua).*

The male is about an inch and a half in the expanse of its wings, and the female somewhat more. The wings are white. The plumelets of the horns or antennæ, and the tuft at the end of the body, are yellowish brown.

The female lays her eggs in July and August, and, to protect them from the summer heats, she covers them in a neat manner with the shining silky down which grows in the form of a tuft at the extremity of her body, where she also possesses an instrument, somewhat resembling the points of a pair of sugar tongs, which she uses as tweezers for pulling on the down and spreading it over her eggs. Reaumer justly remarks, that though she is generally very sluggish in her movements, she uses her tweezers with surprising quickness on all sides, first plucking off a bit of down and spreading it out, and then laying an egg upon it, and covering it neatly over, and smoothing the down in the proper direction. These eggs are hatched late in the summer.

The caterpillars are very hairy, with two red longitudinal stripes on the back, and white tufts at the sides. They live together in great numbers, and construct a thick and compact tent or web of their grey silk threads, upon some branch or branches of a tree, sometimes interlacing whatever leaves may happen to be in the way. If this web or tent be opened it will be found to be divided into several compartments, in each of which one or more caterpillars live separated from the others by partitions, which are of slight texture at first, but are afterwards made thicker to keep out the frosts. They feed on various fruit trees, oaks, hawthorns, blackthorns, elms, rose trees, and brambles, and sometimes, though seldom, on willows and poplars. When they abound in an orchard they commit most serious devastation, for, by their destroying the young buds, they prevent the trees bearing a due quantity of fruit.

The eggs of different broods, and even different eggs of the same brood, do not always

hatch at the same time, some being hatched on the ensuing season, others not till the second season, and others again not till the third season; and this uncertainty in the time of their hatching may perhaps account for the caterpillars being so numerous in some years, and so scarce in others. In 1782 multitudes of them appeared in England, and caused the most alarming apprehensions for the consequences of the destruction which they were committing on the trees. Mr. W. Curtis, who published a quarto volume treating upon this species, tells us that, in many of the parishes near London, subscriptions were raised to employ the poor people to cut off and collect the webs containing the caterpillars at one shilling per bushel, and which were burnt under the inspection of the churchwardens, overseers, and parish bea-les. During the first day of the gathering of them in the parish of Clapham, eighty bushels were collected. In 1833 I observed them in great abundance on the rose-trees in gardens about Leytonstone and Snaresbrook, in Essex.

At the end of summer, and after the fall of the leaf, the winter nests, or webs, containing the caterpillars, should be searched for, as they may then be most readily detected on the branches. They should be burnt or scalded, to destroy the inhabitants. In the spring and summer, when the caterpillars have left their webs, grown larger, and are feeding on the trees, they should be collected by the hand, taking care not to rub your eyes or face with the hand until you have wiped off any of the insect's hairs which may have come off on to the fingers. Owing to my not having taken this precaution, I once had my eyes and face rendered, for two or three days, very sore and inflamed after handling several of these caterpillars, which I was keeping in a box to observe their transformation.

The chrysalides, which are of a blackish colour, hatch in July.

Figures of the moth, its tweezers, and the web of the caterpillar, may be found in *Insect Transformations*, p. 83, 84; *Insect Architecture*, p. 330, 331; and of the eggs in Shuckard's *Manual of Entomology*, plate 1, fig. 4.

*The Mole-cricket, Fern-cricket, Churr-worm, or Evechurr (Gryllotalpa vulgaris).*

This insect is very common in the gardens and corn-fields of Wiltshire, Hampshire, and some other counties; although in various other parts of England it is comparatively rare or unknown.

It is one inch and three quarters in length, and eight inches and a quarter in the expanse of its wings. Its breast consists of a thick, hard horny substance, which is further strengthened inside by a double frame-work of strong

gristle, in the anterior part of which the shoulder blades of the fore-legs are firmly jointed; a structure evidently designed to protect the breast from injury during the powerful muscular action of the fore-legs when digging. The fore-legs themselves are very strong, and admirably constructed for the purpose of digging, "the shanks of them being," as Kirby and Spence observe, "very broad, and terminating obliquely in four enormous sharp teeth, like so many fingers; the foot consists of three joints—the two first being broad and tooth-shaped, and pointing in an opposite direction to the teeth of the shank, and the last small, and armed at the extremity with two short claws. This foot is placed inside the shank, so as to resemble a thumb, and act as one. The direction and motion of these hands, or fore-legs, is outwards, as in moles; thus enabling the insect most effectually to remove the earth when it burrows. By the help of these powerful instruments it is astonishing how rapidly it buries itself. This creature works underground like a field mouse, raising a ridge as it goes; but it does not throw up heaps like its namesake, the mole. Mole-crickets will in this manner undermine whole gardens; and thus in wet and swampy situations, in which they delight, they excavate their curious apartments." Having excavated many caverns and winding passages, it forms its nest, which, according to Gilbert White, is a "chamber, neatly smoothed and rounded, and about the size of a moderate snuff-box. Within she deposits, in the beginning of May, about a hundred eggs of a dirty yellow colour, and enveloped in a tough skin, placed within the influence of the sun, just under a little heap of fresh moved mould, like that which is raised by ants." It is said, that at the approach of winter it always lowers the depth of its nest, so as to be beyond the reach of the frost; but raises it again on the return of warmer weather, and elevates it in proportion to the temperature of the atmosphere. She sits near the entrance of her nest, to seize and destroy any predacious insect which might attempt to feast upon her eggs. She can run forwards and backwards in her burrow with equal facility, being furnished behind with two simple appendages, somewhat like antennæ, which serve to apprise her of any danger or obstacle when making a retrograde retreat.

In the daytime, the Mole-cricket remains under ground, but it flies about at night time. It flies like a wood-pecker, rising and falling in curves, alternately ascending with expanded wings, and descending with them closed. "The Rev. Dr. Sutton has informed me, that when he was curate of Ickleton, Cambridgeshire, in 1780, a farmer of that place, of the

name of Simpringham, brought to him a *mole-cricket*, and told him that one of his people seeing a *jack-o'-lantern* pursued it and knocked it down, when it proved to be this identical insect. This singular fact, while it renders probable that some insects are luminous which no one has imagined to be so, seems to afford a clue to the, at least, partial explanation of the very obscure subject of *ignus fatui*, and to show that there is considerable ground for the opinion long ago maintained by Ray and Willoughby, that the majority of these supposed meteors are merely luminous insects."—(*Introduction to Entomology*.)

In fine evenings, about the middle of April, the mole-cricket makes a low, dull, jarring noise, continued for a long time without interruption. Gilbert White says, this sound is not unlike the chattering of the night-jar (*Phalacrocorax Europæus*); but other writers compare it to the continuous note of the grasshopper warbler (*Salicaria locustella*). Kirby and Spence say they once traced a mole-cricket by its note to the very hole, under a stone, in the bank of a canal, in which it was concealed.

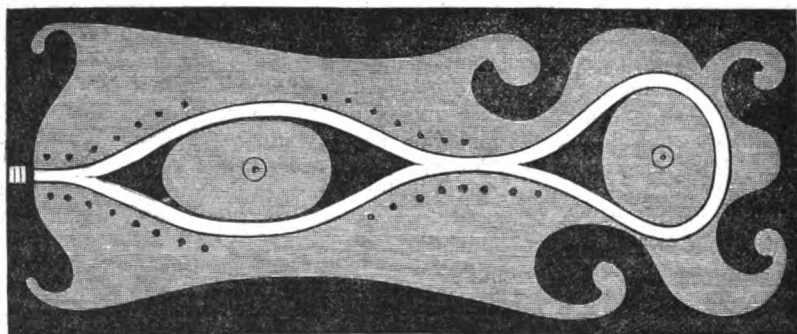
There is some difference of opinion about the injuriousness of this insect. Baron Walckenaer says, it "is supposed to do much injury in Europe, particularly in the southern countries; it makes subterranean galleries, tears and removes the roots of plants by means of its palmated fore feet, in order to form a habitation for its young, and also in the pursuit of insects, multitudes of which, especially such as are injurious to agriculturists, it pursues and destroys: *it never eats the roots or any other parts of vegetables*."—(*Annales de la Société Entomologique de France*.) Dr. Kidd says, it will eat raw meat, and attack and devour another of its own species; and Gould fed a mole-cricket for several days upon ants. The editor of the *Entomological Magazine* asserts that it is "more beneficial than otherwise, by devouring subterraneous larvæ, &c." (iv. 290). But even admitting, for mere argument sake, that the mole-cricket only eats insects, a point which I do not think has been satisfactorily established, yet may it not often do more harm than good when it burrows in grounds where insects are few and far between. The mole is often of use in grounds, but where it abounds, it does as much, if not more, harm than good. So, no doubt, in the case of this insect. In England, it often burrows in gardens which are near streams and ponds, and commits great ravages upon the peas, beans, potatoes, cabbages, and other plants, the roots of which it is said to devour. Gilbert White says it will destroy whole beds of vegetables. Sir W. Jardine says it does great damage to newly

sown seeds. Baeckner says, that the kitchen gardens in Scania suffer extremely every year from the ravages of the mole-cricket.—*Amœnitates Academica*, iii., 335.) Kirby says, it does so much mischief in Germany, that the author of an old book on gardening, after giving a figure of it, exclaims, "Happy are the places where this pest is unknown." M. Robert, director of the Botanic Garden at Toulon, in which country the crops of peas and beans sustain much damage, says he captures them by placing fresh sods or turfs on the beds or borders of the garden where any traces of the insects are seen. These turfs being well wa-

tered overnight, attract the insects to hide under them, where they may be easily caught in the morning. This scheme persisted in, will soon rid any place infested with them, especially during the months of April, May, and June. As the galleries may always be recognised by the slightly elevated ridge of mould the insect throws up as it proceeds, the nest should be traced, and the eggs therein destroyed.

Figures of the mole cricket may be found in Kirby's *Introduction to Entomology*, plate 2, fig. 2, plate xv., fig. 6, and Rennie's *Insect Architecture*, 243, 244.

J. H. F.



#### LAYING OUT GARDENS.

If we continue to give new plans for the slips of gardens, behind rows of houses, until people leave off requesting them, we have much more to do yet. This, although not altogether uniform, is a mixture of the uniformity with the landscape. The path is uniform—the other portions are varied just enough to prevent

sameness. As before, the black represents the borders and beds, or clumps; the lighter ground is intended for grass, and the path speaks for itself. Of course, it is intended that the borders and clumps shall be well and thickly planted, otherwise the concealment of the real boundary will not be complete.

#### ON THE NATURE OF THE SPONGIOLES OF ROOTS.

It is almost incredible how widely theorists differ from practical men, and how obstinately they contest with gardeners the particular positions they once take up; yet how utterly futile are all their endeavours when opposed by practice. We remember once, a paper of Mr. Knight's being read at the Horticultural Society upon this very subject, and the substance of that paper was, at the time, greatly canvassed by the gentlemen who had to support a theory of an opposite character. It is interesting on account of the application of the theory to the principles of potting, but like most other theories will break down in part, when tested by practice and experience. In the theory of Horticulture, we are thus admonished—"The principal office of the root is to attract food from the ground: for this purpose it is furnished, as has been seen, with

an extremely hygrometrical point or *spongelet*, which is capable of absorbing incessantly whatever matter of a suitable kind may lie in its neighbourhood," what says Mr. Knight on this matter?—

"An opinion is very extensively, if not generally, entertained, that the nutriment which trees and other plants derive from the soil in which they grow, is exclusively taken in by the cellular extremities of their roots, which from their texture, have been called *spongioles*; and which, in their organization, differ from other parts of the root, in being totally without any albumen or woody matter distinct from the bark. But it is through the *albumen alone* of trees, as I have proved by a great variety of experiments, and as is, I believe, generally admitted, that the ascending sap, under ordinary circumstances, passes up from

their roots into their branches and leaves; and as this substance does not exist in the spongiole, my attention was directed to an inquiry whether the spongioles possess the power of transmitting fluids, and, if such power were found to exist in them, through what peculiar channels such fluids pass up: and as these questions are necessarily interesting, and to some extent in particular cases, may become important to the practical gardener, I communicate the result of my experiments.

"Spongioles are obtainable in the most perfect state from large seeds, such as those of the common or French bean, which have been permitted to germinate by simply detaching them from the cotyledons; as they thus remain united to the caudex of the plant, and its bud and plumule. Many of these were obtained from the seeds of plants of several kinds, and subjected to various modes of treatment in soils of different qualities; but all perished without a single plumule having expanded, or having apparently received any nutriment either from the soil or other source. Yet the spongioles, in these cases, must have contained greatly more living organizable matter, derived from their cotyledons, than the whole body of the seed of a very large majority of plants can possibly contain: but they were, I conclude, incapable of transmitting it into the plumules, owing to the want of albumen.

"I, therefore, believe my opinion, that spongioles are imperfectly organized parts of the plant, which neither absorb from the soil nor transmit fluids of any kind for the service of other parts of it, to be well founded; but albuminous matter is generated with great rapidity within them; and they become to a very great extent transmuted into perfect roots long before the growth of the stem or branches of the tree commences in the spring, and by these newly formed roots (but not by these exclusively) I conceive that nutriment is absorbed from the soil and sent up into the leaves, to be there converted into the true sap of the plant. I am aware that the above-stated opinions are in opposition to those of many eminent physiologists, to which much deference is due; but *I think that they have erroneously included within their spongioles portions of albuminous fibre, a substance never found in the organ properly called a spongiole.*"

All we shall say on this subject is, that Mr. Knight was a practical man.

#### POULTRY.

As a matter of economy every cottager should keep poultry; and the following are excellent rules for their guidance, although it is a sys-

tem pursued in America, it is none the worse for it.

1. Never allow more than twelve hens to one rooster, a smaller number, say eight, would perhaps be better.

2. Never allow the roosters to go together; they are very jealous, and always pugnaciously interfering with each other's rights. The strongest lead away the hens; the consequence is, the eggs are fewer, and do not hatch so well. Hence, the universal complaint that a large number of hens are not so profitable, in proportion, as a smaller number.

3. Chickens require a great deal of water to soften their food, and gravel to grind it. They also require animal food. In winter they often cannot get water nor gravel, nor insects nor worms. They are all fed, it may be, with grain, yet do not lay. Give them water, gravel, and animal food, such as fat, meat, liver, or indeed any kind of fresh meat. Keep them warm, not permitting them to become chilled, and they will lay as well during the winter as in any season.

4. Do not permit your hens to set at different times, or rather only a few at a time. This causes broods of different ages, and the younger are usually injured or deprived of a fair quota of food by the older. When your hens manifest a disposition to set, let them remain on chalk eggs until as many as you intend to set are ready. Then place fifteen fresh eggs under each hen.

5. When the young are hatching, do not interrupt the hen. When hatched, feed them with Indian meal, with a large portion of pounded egg shells. Hens that set "out," as it is called, generally have healthy chickens. I often have examined their nests, and seldom found any remains of the shell in them. The little ones eat them up. I have found that egg shells greatly advance their growth and health.

6. If all the little chickens could be taken from the hen, and kept in a room warmed by a stove, I am satisfied from experiments, that they would do much better than to be with the hen.

7. Never allow the young chickens to get wet, nor to become cold. See that they are supplied with ground worms (fishing worms). They will repay you for this trouble.

8. Three times a year, at least, grease the head, throat, and under the wing of your chickens. A very small proportion of precipitate added to the lard is of service. You will never have your hens troubled with lice if you follow this rule, and keep your hen house clean.

9. Never allow your chickens to be without food.—I have often been asked, what is the best food to make hens lay. Give your hens

and rooster (who, by the way, requires as much, nay, more attention than the hens), water, gravel, and animal food, and they will lay as well on one kind of food as on another. Potatoes, corn, wheat, rye, oats, buckwheat, barley, and any thing that they will eat will do. Boiled food is cheapest and best for hens, especially if kept up all the year, as they should be. I have followed the above rules ever since I owned chickens. We have always had more eggs than was required for use; and our chickens have never had any epidemic among them. With the exception of moulting season, that is, when they shed their feathers, with judicious management, hens will lay for 260 days in the year.

10. Hens lay well and do well for four years. How much longer they would continue fruitful, I know not.

11. There is a great difference in hens. Some lay every day until they empty the ovary. Others twice in three days; others only every other day.

12. Never frighten nor chase your chickens, unless they get into your garden. In that case, I have found the crack of a whip more effectually deterred them than any thing else, from venturing into forbidden ground.

There is a simple mode of confining poultry to a given space. Drive stakes down, like dahlia stakes, say five feet high, and fasten a common sort of net to form a wall: clip one wing of all of them; sweep up the dung frequently, for it is valuable in the garden, more so than half the other composts and manures.

#### TREATMENT OF STOVE PLANTS IN WINTER.

ALL plants are naturally subject, in a certain extent, to the vicissitudes of winter, spring, and summer. It follows, therefore, that, in a state of cultivation, something analagous should be followed by the cultivator in imitation of those changes. To keep tropical plants at a high temperature during winter, when there is little sunshine, is to excite their growing principle at a period when they should rather be at rest; and where such a practice is followed, the plants become drawn up, weak, and leafless, in consequence of the perpetual, or, we may say, in this instance, unnatural stimulus to excitement which the application of heat produces. It appears, from practice and observation, that the temperature of the plant stove should be kept as near to from sixty to sixty-five degrees as possible during the dark days of winter, for all that is then required is to prevent the plants from being checked or chilled by cold during that season; so that, as spring naturally comes on, a further, but gradual, stimulus may be given them by addi-

onal heat, and most particularly during the day.

Water must not be entirely withheld, particularly from some species; but a much less quantity of it is necessary than when the plants are in a growing state, and able to decompose a greater portion of that element. Some species require none for several weeks together; and such may be ascertained by their habits of growth, and are of the herbaceous and bulbous sorts. As these naturally ripen their foliage in autumn (or at whatever other season), and appear to die down to the ground, they should be observed, and collected as near together as circumstances will admit of, and a suspension of watering should then gradually take place, and be continued in till they begin to show signs of vegetation in spring, when they should be again supplied as usual. Some species, which require very little water during winter, do not lose their leaves, nor die down to the surface of the pots; but it is only observation on the part of the cultivator that can direct him in these instances when to water, and when to withhold it. It is, as we have repeatedly observed, one of those cases in horticulture for which rules may be laid down, but not wholly without exceptions, and must entirely rest on the judgment of the cultivator. Steaming the stove during winter is a material feature in the best management of such plants, and should be scrupulously attended to, both to soften the atmosphere of the house, as well as to prevent the increase of insects, particularly the red spider, which is sure to make its unwelcome appearance in a high and dry atmosphere. The most eligible time for steaming the house is in the evening, when the flues are hottest, and it is performed by pouring water on them, which generates steam readily. In time of severe frost, this operation may be performed during the day, or dispensed with for a few days altogether. The quantity of water required to produce a sufficiency of steam depends on a variety of local circumstances, such as the size of the house, the way in which the water is put on the flues, &c.; but it may be safely asserted, that more than is necessary is often used when it is poured on them by random, or done in too hurried a manner. In steaming all sorts of hothouses, as well as in their whole management, it can only be expected to be well done when the operator feels an interest or pleasure in doing it. A few minutes more spent in applying it regularly and leisurely over the whole surface of the flues will do more good than sluicing a hogshead of water over the house in a careless manner. During the winter months very little ventilation is required in these structures; for, unless the house be unusually well glazed, and

in complete repair, a sufficiency of fresh air will find its way into it between the laps of the glass and other openings; indeed, greater care should be had to the exclusion of cold air during winter than to its admission. The plants are, for the most part (as observed above), in an inactive state, and, therefore, not in want of those gases which compose certain parts of atmospherical air, and which are found so necessary for them when in a growing state.—*The substance of a paper read before the Horticultural Society.*

#### MIGNONETTE.

MIGNONETTE is a native of Egypt, and was introduced into Britain about the year 1754; but it has become so generally diffused, both here and in France, that it has become in a degree naturalised. It is not long since that we read an account of its growing upon the walls of an old ruined chateau, in the neighbourhood of Paris, springing out from every crevice where the seed could obtain a lodging place, and literally covering the walls with its odorous blossoms. In the *Paris Marche aux Fleurs* and the markets here, thousands of pots of it are annually sold, and the window of the peasant, as well as the saloon of the opulent, is decorated throughout the season with pots of this favourite plant. The mignonette is of remarkably simple growth in the open ground, and when once the seeds are planted, it will retain possession of the soil, springing up from self-sown seeds, and flowering early and abundantly every season. Successive sowings in May and July will afford a constant supply of neat and compact plants, filled with flowers. In rich moist soil the plants grow luxuriantly and spread out widely, but have a very scanty display of flowers; it is in a dry and rather hard soil that they show themselves to the best advantage; for in such a situation they bloom early, and, without spreading out their recumbent branches too far, are, at the same time, overloaded with blossoms. Those cultivators, therefore, who would have the plants in the greatest perfection, should select the driest spot in the garden, and sow the seeds thickly. But it is for the production of good plants for flowering in the winter that we commenced these remarks. To bloom the mignonette in good perfection from the decay of the out-door plants in the autumn, until the return of the flowers in the spring, it is necessary that there should be two successive sowings, viz., one in August, for blooming about Christmas, and another in September, for blooming from February till May. Select for the purpose as many pots as are wanted; fill them with a compost mixed in about the following proportions, viz. one half

good light loam, one quarter leaf mould, and one quarter coarse sand. First give the pots a good drainage, for the health of the plants depends much on this; then fill them up to within half an inch of the rim, giving the pot a slight rap to settle the soil well; level the surface, sow the seed thickly, and cover it with about an eighth of an inch of the same compost. A frame (an old cucumber bed will answer) should then be ready to receive the pots; set them so that they will not be far from the glass, and give a gentle watering; put on the sashes, and shade with a mat in the middle of the day, if the sun is too powerful, until the plants are well up. Give water cautiously and in small quantities, as the plants will damp off if they are kept too wet. Thin out the plants, leaving only three or four in a pot. In the month of November or December, according to the mildness of the season, the plants should be removed to the green-house or parlour: in the former place they should be placed on a shelf within two feet of the glass, and if nearer they will thrive better. Water should be given sparingly, and when the plants get up an inch or two, the tops of each should be pinched out in order to make them branch well. They will now grow slowly, and early in January will come into bloom. In the parlour they should be set as near the window-sash as possible, and in the most airy part of the room.

When the plants have done blooming in the spring, they may be turned out into the border, where they will throw out new branches, and make good plants for bloom all the summer.

#### ERRORS IN HORTICULTURE.—NO. I.

ONE of the most common is the system of watering plants. Almost all authors, except Mr. Towers, are silent or ambiguous upon this subject. He has gone more fully into the matter, and given reasons for the plan which he recommends.

Watering is a most essential branch of culture. It has been already fully explained that the seed cannot vegetate, and the plant cannot grow, without water. Carbon, and all the other substances which form the food of plants, must be dissolved in water to enable the spongioles to take them up; and the spongioles themselves, unless they be kept moist, will soon lose their power of absorption. Nothing, indeed, can be more evident, even to a common observer, than the necessity that plants feel for water; if a mimulus or a pelargonium in a pot, for example, hangs its head and droops its leaves, what an extraordinary and rapid effect is produced by giving it water! In an almost incredibly short time its leaves become firm,

and its stem erect; and the plant is not only preserved from death, but restored to full health and beauty. Watering appears an extremely simple operation, yet, nevertheless, there are several points relating to it that it is necessary to attend to. One of these is, never to saturate the soil. Water, to be in the best state for being taken up by the plants, should be kept in detached globules by the admixture of air; and it should be only slightly impregnated with nourishing matter from decaying animal and vegetable substances; for, as already observed, when fully saturated with nourishment, it becomes unfit for the food of plants. Nothing can be more admirably and wonderfully adapted for supplying plants properly with water than rain. In falling through the atmosphere it is thoroughly mixed with the air, and in sinking into the soil it becomes slightly impregnated with nutritious qualities, which it is thus enabled to convey, in the most beneficial manner, to the plants. It is a very common mistake in watering, to pour the water down close to the stem of the plant. This is injurious in every respect. Water, when poured profusely on the collar of the plant, which is the point of junction between the root and the stem, is likely to rot or otherwise seriously injure that vital part; while the spongioles, which alone can absorb the water so as to benefit the plant, being at the extremity of the roots, are always as far removed from the stem as the nature of the plant will allow. Thus, the distance from the stem at which water should be given, varies in different plants. In those that have tap-roots, such as the carrot, and many other culinary vegetables, the lateral fibrous roots are short, and the spongioles are comparatively near the stem; but in trees, and in most plants having spreading roots, the spongioles are generally as far distant from the stem as the extremity of the branches, and the water, to be efficacious, should be given there. In spring, when the sap first begins to be in motion, and the young plant is every day unfolding fresh leaves or blossoms, it requires abundance of water, as it does when in flower or when the fruit is swelling. In autumn, on the contrary, when the fruit is ripening, and in winter, when the plant is in a state of perfect rest, very little water is necessary, and much is positively injurious, as being likely either to excite a morbid and unnatural action in the vessels, or even to bring on rottenness and decay. Water is necessary for seeds to induce them to germinate, but much of it is very injurious to young plants when they first come up, as it unsettles their roots, and almost washes them away. The roots, also, are at first too weak to imbibe water, and the plants feed on the nourishment contained in the cotyledons of

the seeds. It is when the second pair of leaves has opened that water is required, though it should at first be given sparingly. When the plant begins to grow vigorously, it requires more food, and if it be then kept too short of nourishment, it becomes stunted in its growth. The quantity of water requisite also depends on the kind of leaves that the plant unfolds. A plant with large broad leaves, like the tobacco, requires twice as much water as a plant with small pinnate leaves, like an acacia. Plants exposed to a strong light also require more than plants grown in the shade, and many other circumstances affect the quantity that should be admitted. Writers differ a good deal upon the subject of what time a plant should be watered. Mr. Towers says:—"The time for watering plants varies according to the season. In spring and autumn it is best to water plants in the morning; but in summer, the usual time is the evening; while in winter, the very little that is required, should be given in the middle of the day. Many persons object to watering their plants when the sun is upon them; but this is not at all injurious, so long as the water is not too cold, and is only given to the roots. Watering the leaves when the sun is upon them will make them blister, and become covered with pale brown spots wherever the water has fallen. It is much better to water plants during sunshine, than to suffer them to become too dry; as when the spongioles are once withered, no art can restore them. When plants have been suffered to become too dry, the ground should be loosened before watering it; and water should be given a little at a time, and frequently, till the plant appears to have recovered its vigour. A great deal of the good produced by watering depends on the state of the ground; as when the ground is hard and compact, it is very possible to throw a great quantity of water upon it without doing any service to the plants. The kind of water used should also be considered. The best is pond-water, as it is always mixed with air, and is, moreover, generally impregnated with decayed animal and vegetable matter; and the worst is clear spring-water, as it is always cold, and is seldom impregnated with air, or with anything but some mineral substance, which, so far from doing good, is positively injurious to the plants. Rain-water collected in open cisterns, and river-water, are both very suitable: and when only spring-water can be obtained, it should be exposed for some time to the air before using it. It is always advisable to have the water at least as warm as the plants to be watered; and for this reason the water to be used in hothouses and greenhouses, is generally kept in an open vessel in the house some hours before using. Watering with warm water is



very efficacious in forwarding the flowering of plants."

We have often seen old florists, and many of our present exhibitors, put warm water into flower tubes to expand the blooms of tulips more freely, and in many cases, warm water is for the time more efficacious than cold, but there is a good deal more to say on the subject of watering.

#### ON MANURING.

EVER since mankind tilled the earth, in order to produce fruits for their sustenance, and animals for the double purpose of affording them food and raiment, it has been found absolutely necessary to prepare the ground in some way or other for the reception of the seeds, and to apply, by any method possible, some fertilizing means, in addition to the natural aptitude of the soil, in order to produce and to sustain the production of the articles which had been found most suitable for the climate of the country where the people had fixed their residence. Some countries are so blest by nature, with a fruitful soil and climate, that very little exertion is required in procuring the necessities of life; but that little exertion is invariably applied to the cultivation, in the way best known and attainable from circumstances, of the articles which time and experience have pointed out, and which nature has ordained to be the productions of the different parts of the globe. In our temperate latitudes, we find, from physical causes, that the moral and intellectual powers of mankind are more completely developed than in the other divisions of the earth. Some countries, from geographical position, are incapable of cultivation, and of supporting any considerable number of inhabitants. Many are wholly sterile; and others, that are naturally very fruitful, are but thinly peopled, from seemingly inexplicable causes, and produce, with very little attention, the necessities which the undeniable wants of the few people demand. Cultivation progresses with civilization of mankind and the increase of population. As the numbers of the human race multiply, means must and will be found to support them; and as the temperate latitudes appear to be most favourable to the natural and intellectual existence of man, we accordingly find that there the means of production and of cultivation have been pushed to the greatest length, and have progressed in a commensurate ratio with the numbers and civilization of the inhabitants. With the exception of the wild and untutored savage, but one small degree removed from the animal creation, who, for his sustenance, plucks the fruits of the forest, and runs down the beasts of the

wilderness, we find a cultivation of some sort to prevail, so soon as the first dawning of civilization has fixed a residence, and a manuring also, of some sort, to accompany the cultivation, both of which advance in kind and degree as the people advance in numbers, experience, and observation.

Egypt has the inundations of the Nile to support fertility. India has irrigation to produce its rice; and most countries possess some natural means of aiding the soil in the growth of the produce of the climate. In our island, which seems eminently qualified by nature both for civilization and for cultivation, and in all other countries, with the exception of some newly-discovered, which contain spots of great fertility, owing to non-occupation and to exuberant vegetation, it is established as an undoubted and incontrovertible fact, that the productive powers of the earth must be sustained by extraneous applications, and that, according to the liberality of these applications, the produce will be found to be greater or less. This well-known fact requires no demonstration; and such being the fact, the enquiry becomes a very important one, whether every known means have been laid hold of, and used, to sustain and carry forward production, in order to meet the demands of a dense and increasing population? and if cultivation and manuring together have been pushed to the utmost limits of our present knowledge of the art, in order to secure to the people the blessings and comforts to be derived from the earth—the gift of the Creator of the world, and the Great author of their being? No more important subject can be proposed for discussion; it is connected with political, and many intricate causes, which are not for discussion in this place; and the few observations I intend to make will be confined to the simple case of manuring, in order to increase the quantity of produce of every kind.

Our manures are naturally divided into vegetable and fossil: the former comprehending those produced from plants grown on the farm, and used as food and litter for animals, and mixed with their excrements; the latter including all other sorts, lime bones, and other auxiliaries, which, though not strictly fossils, may be comprehended under that name for the sake of brevity of division. The vegetable manures beat every other yet brought into competition with them: from "bulk and from future decomposition," they add to the staple of the soil; whereas, the other class soon fail in effect, though they be, in particular circumstances, as effectual as the former in raising a crop. Favoured situations only admit of their being applied—the vicinity of towns and villages, and densely peopled countries, afford

many advantages; but even there, "a quantity" can seldom be procured to produce an extensive result—the source of supply is soon exhausted. Very often the price of a rare article is raised beyond the probability of remuneration. In many places lime itself is of distant and expensive carriage, and the farmer is thrown upon his home resources, upon what manure he can raise on the farm, or procure within a moderate distance. Most arable farms if judiciously conducted under a proper alternation of green and grain crops, will afford manure to support and even improve themselves; but at the first outset an extraneous supply is necessary, in order to raise the first crops that are to produce others; but, after that object has been attained, no opportunity ought to be neglected of procuring manures of any kind.

With the exception of some few excellent cultivators, which are to be met with in every part of the kingdom, we find great neglect to prevail in the management and preparation of this most essential of all articles for the consideration of the farmer. On approaching a farm building, the moisture of the yards meets us on the road, or is gathered into a pond in the centre, and useful only in floating ducks and geese. The yards themselves are purposely placed on declivity, to lose the benefit of the moisture, and to keep the straw dry, and the dung from the stables and houses is thrown carelessly into a heap, there to smoke and fire-fang—to decompose to useless rottenness in the inside, and the outside to remain in its original strawy state. Now, reason and experience sufficiently show us that great loss is here sustained from want of original arrangement, and of subsequent attention. The yards are too large to keep manure in a level moist state, and are besides cold and uncomfortable for stock. The yards ought to be sunk at least two feet below the level of the surrounding locality, and the shelter shed a little higher, that the cattle may lie dry. All the moisture within the bounds of the farmery will fall into these yards, and be absorbed by the litter and dung daily carried into them from the stables and cowhouses; and care should be used to mix as much as possible the different qualities of dung of horses, cows, and pigs, and daily to spread every thing carried into the yards thinly and evenly over the surface. The dung will thus lie in a level, moist, and compact state, with the least possible surface exposed, and ready at any time to be carried out to the field, where it is intended to be applied. If it be carried out a week or two before application to green crops, it should be laid lightly into a square compact heap, of four or five feet in height; fermentation will soon take place, and every exertion

should be used to get it laid or covered, and the seed or plants inserted, with the fermentation and decomposition in that warm and active state. But if it be carried out to the field at some inconvenient previous time, as is most likely to happen with the greater part of it, then the carts and horses should go over the heap, to prevent, by compression, the decomposition when not wanted; and then, by turning over the heap eight or ten days before using it, a state similar to the former will be obtained. No mixtures of soil, or any other substances, should be mixed with home-yard manures; but if dung of similar composition be got from towns or villages, the two may be mixed very suitably, which will make the dung of equal quality, and produce equal crops. If the moisture in the yards be too much to be absorbed by the quantity of straw, then the bottom of the yards must have an inclination to a point, where the water will pass by a grate into a conduit, and hence to a tank in some suitable place, and where, by dividing the tank into a higher and lower division, and by placing a wattled wall of loose straw, the water will ooze into the lower division, and the sediment will remain in the higher, and two kinds of manure, liquid and solid, will thus be obtained. The grate in the bottom of the yard may be opened and shut, as the moisture is wanting, or in excess. The utility of liquid manure being very problematical in our climate, the tank to which the moisture is conveyed may be enlarged, so as to contain vegetable and earthy matters sufficient to absorb all the moisture, and thus convert the whole contents into a solid mass of compost, to be taken out ready for application so soon as dry weather has set in, and the moisture has ceased to flow. An elevation should discharge the moisture regularly over the compost heap.

On farms where a wide open bank is kept, as above described, it may more resemble a deep site of a dunghill than a tank strictly so called, and may be made capable of containing all the collections of substances of every sort that can be got around the homestead, and watered regularly with the moisture of the yards; but in other cases, where the moisture is wholly absorbed in the yards, a convenient site for a compost dunghill should be looked out, and excavated, sloping inwards and outwards, with the sides built perpendicular with stones or bricks, so as to facilitate the approach of materials to be laid on the heap. The bottom of the compost should consist of a thick layer of earth and vegetable substances, and to this heap every kind of decomposing articles that can be found must be carried—scrapings of roads, scourings of ditches round the homestead, weeds, wash of every sort from the farm-houses, and

night soil, and, in short, substances of every kind that can be found to add one barrow load to the accumulating heap. On farms, and in villages, these latter means are wholly neglected; night soil may be very conveniently collected in wide casks, which, when full, may be pulled backwards on a level space, and then raised into a cart by means of a moveable lever power, and conveyed to the compost heap, and spread regularly and thinly over the surface. A very trifling gratuity would induce the inhabitants of any house to put into the same cask all watery collections whatever; and, in case of large farm-houses, a separate cask may be placed to receive soap suds and washings of all sorts, and the compost heap would thus be enriched with solid and liquid substances, and could not fail to produce a most valuable manure, if due attention be paid to apply the materials in due proportion, so as to keep it in a proper state of moisture and absorption. A turning may be necessary before using it. This compost heap is recommended on every farm, on the principle that no substances be carried into the yard except straw and excrementitious matter; and, in order to facilitate the decomposition of that straw where it is of tall and strong growth, and to reduce it to a shorter state, so as to be more easily mixed and blended with the soil, I have proposed to cut all straw, even for litter, to the length of six to twelve inches, by means of air cutters being provided with a very quick motion of the feeding roller, and a slow one of the cutting knife. Much difficulty is often experienced in case of rank and tall crops; the straw being used wholly for litter in the yards, will lie for many weeks without alteration; but where the crops are shorter, and straw more scarce, little difficulty occurs; in fact, straw is often wanting for litter, as all, or the greater part, is used as provender for stock. A difference of soil and climate creates such differences, to which we must accommodate all our plans and operations.

The yards containing all litter and excrementitious matter only, and the compost heap being kept in the way I have recommended for collecting and preparing every other substance in and around the homestead that occurs to the eye and reflection of the farmer as likely to improve the quality, or add to the bulk of the heap, his attention must also be directed to composts in the field; for where no extraneous supply is at hand, he must depend on the two sorts afforded by every farm, putrescent and composts. Few or no situations occur, inland or lowland, where no means can be used—road sides and ditches present a constant supply—in many places overgrown fences occupy a great part of the field, and offer a

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vast quantity of soil and vegetable matter for compost, and lime is mostly to be had within short or moderate distances. I have found clay itself, with a liberal dose of lime, to make an excellent compost, both on arable and grass lands. I prefer a well prepared compost to an application of lime alone: I may be wrong, but such is my conviction; and I have even known the soil of the field itself to be sifted and mixed, and laid on again with excellent effect. But we may travel many days without seeing a heap of any sort—the expense, or some excuse, is always ready; and when it is attempted, a mistake is almost universally committed, in not allowing sufficient time for lime and soil to incorporate, and in not turning the heap often enough, that every clod and lump may be broken and pulverized, and ready to mix with the soil in a finely divided state. On the contrary, we see it laid on land nearly as rough as when raised; and I have seen it carted from the ditch, and spread on grass lands, and cut in pieces, in order to save the expense of preparation, with a cheap supply of lime within a couple of miles. Such management reflects great disgrace on our improved knowledge of agriculture, and throws back upon the farmer many of the complaints we daily hear of the distressed and oppressed state of his business, and compels many comparisons to be made of his exertions, and of those of other classes of producers similarly employed.



CAMPANULA HEDERACEA, IVY-LEAVED  
BELL-FLOWER.

THE Campanula, perhaps, boasts as many species and varieties as almost any genus among dwarf flowering plants. From the small creeping kinds which merely cover the surface of the ground with their leaves, and throw up their myriads of flowers scarcely two inches from the foliage to the magnificent variety called *Pyramidalis*, which will present a surface of many feet with its dense pyramids of flowers,

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there is hardly one that is other than beautiful. The variety now mentioned is dwarf, with bright green leaves and blue flowers on slender stems, it forms a beautiful object in small clumps and borders, in pots, and on rock work, and well deserves a place among even choice collections.

#### FRENCH MODE OF CULTIVATING THE CINERARIA.

YOUNG plants in small pots, bought in from nurseries, about the end of March, may be placed in a greenhouse, where they will not be far from the glass, but they should not be allowed to receive directly the rays of the sun. The plants ought to remain for some days in this situation, and in the mean time soil may be prepared into which to repot them. This should consist of thoroughly decomposed leaf mould, mixed with an eighth part of soil from an old hotbed. After the first potting, when the plants have taken certain hold, repot them again, taking out the crocks without disturbing the roots. As the plants become larger, the compost may be made richer, and mixed in the proportion of about three parts of leaf-mould to one of soil. The first potting should take place about the middle of April, and the second in about a month afterwards; at every potting take a pot broader and higher by half an inch than the ball of the plant, and see that the upper roots are not covered too deeply with soil, for that is hurtful in general to all plants. At the commencement of June every *Cineraria* should be sticked and exposed to the air, placing them where the heat of the sun does not concentrate upon them with too much force. During the month of June and July great care should be taken to water them, particularly in the afternoon, and when the sun has ceased to shine upon the plants. They may also be watered in the morning before 8 o'clock, without any danger. Towards the end of August, or a little earlier, you will observe at the base of many of the plants little shoots which proceed from the roots, the stem, and the axils of the lower leaves. They speedily root in the upper layer of the ball, and should be carefully taken up, as much for multiplying the rare sorts, as for clearing the plants of young suckers, which would otherwise take away a part of the sap which the plant requires to strengthen it, in order to become a good specimen. If *Cinerarias* are treated in this manner, they will be covered the following spring with rich and abundant flowers. The little suckers taken up may be put into pots of a proportionate size, placed in a hotbed and shaded from the sun, where, in a fortnight at most, in August, the roots will

show themselves all round the ball. They should then be put into a larger pot, placed close to the window of a greenhouse, and exposed to full light; where they may remain until spring. The parent plants should be put into a cool greenhouse, or frame, about the middle of October, and remain there all the winter; they may receive as much light, air, and sun, as possible. Towards the end of January place them farther from the glass at the top of the house, and continue to give them as much air as possible in fine weather. If it is desirable to delay the time of flowering a month or six weeks, pot the plants again into larger pots by an inch, before the flower-stalks rise, and the flowers appear towards the beginning of March; large specimens remain in bloom at least six weeks. *Cinerarias* fertilise readily, and seed abundantly, particularly when they are placed in a dry situation, where they have air, and every morning receive a sufficient watering. As soon as the seeds are ripe, they should be gathered and put into a dry place, but only for two or three days. Afterwards you must clean the seeds well, and sow them immediately in very fine and rather sandy leaf mould. They will come up in a fortnight or three weeks afterwards; the young seedlings should be pricked out as soon as they have two well-formed leaves, and two others are beginning to show themselves. These seedlings should be placed for eight days in a hotbed, sufficiently warm to induce them quickly to strike root again. As soon as the young plants have unfolded and formed their first leaves, they ought to be potted afresh, and eight days afterwards placed in the open air, in order to strengthen them before autumn, so that they may the better endure the winter. The seedlings may afterwards receive the same treatment as older plants. A great number of these seedlings, provided they are well taken care of, flower in the spring. You cannot be too careful to take exact notes of seedlings raised from different varieties, until you ascertain which sorts give the best result. If green-fly attacks the plants during winter, that insect may be speedily destroyed, without danger to the plant, by fumigating the house with tobacco-smoke. In spring this should be done very gently, for if the tobacco is too strong, the plants will be injured by it, and perhaps perish. You can never throw tobacco on them in the form of snuff or otherwise, for the contact of the tobacco would quickly kill the *Cineraria*. It is, therefore, in spring much better to destroy the green-fly with the fingers, as fast as it appears. In fact, unless you have a greenhouse expressly for this sort of plant, you cannot burn tobacco without hurting other specimens, which are not at

the time in flower. The *Cineraria* has very little scent; it does, however, very well, while in flower, to be placed in the window of an apartment exposed to the sun. It flowers there as well as in a greenhouse for a considerable time; on fine days in April and May, admit air into the room, at least one hour every day. In this point of view it is, perhaps, the most convenient for a drawing-room, and for this reason it may be expected to become a general favourite. This is a free translation of a paper in the *Revue de Horticol*, and except that all the *Cineraria* requires is a frame, which might be substituted for a greenhouse, it is the same as they are grown in England.

#### THE TREATMENT OF INDIAN AZALEAS.

THE principal methods of treating these beautiful objects, have already been described in a treatise upon the subject. The following are extracts from a paper in the *Magazine of Botany*. There may be some new points or new modes of describing old ones, but, if it be nothing else it is a confirmation of some of our former instructions, and the new matter is from a high authority. In describing the different styles of growth, we are glad the author agrees with us as to the best, he says: "There are, first, the lovely dwarf bushes, which, while not being higher than nine inches or a foot, spread out into a dense mass of foliage and flowers, and often hang far over the sides of the pots. These are perhaps the most natural and elegant of all the shapes which the *Azalea* is made to assume. And they are produced by the propagation of the respective varieties from small cuttings, instead of by grafting or inarching on other stocks. The cutting, once struck, is immediately subjected to pruning, the young leading shoot being pinched off to make it produce laterals. This pruning is likewise continued throughout all the early growths of the plants, and is, in fact, the sole peculiar process by which dwarfness is obtained. Plants thus pruned and stopped soon begin to acquire that individuality of character which makes them so interesting. The pruning must not, however, be confined to a winter dressing back of the mature wood. It should be more especially practised on the young growing shoots during the spring and summer. The acquirement of compact dwarfness may also be facilitated by pegging down some of the lowermost shoots, or tying them to small stakes inserted in the soil, or to a ring of wire fastened round the pot, just below the rim.\* By bending down the shoots in this unnatural

direction, the current of their juices will be partially interrupted, and they will be induced to put forth laterals more liberally. Another system of treating these *Azaleas*, with a view of conferring diversity, is to convert them into dwarf standards, varying in height from one to three or four feet. Where only a low-stemmed specimen is required, it may be raised from a cutting, and the young side-shoots kept pruned off directly they begin to show themselves, till the stem is strong and tall enough to be capable of developing a sufficient number of laterals. These laterals can also be stopped while they are young, that they, too, may produce numerous side-branches. And after an ample density of head has been obtained, the shoots can be left almost wholly to their own progress, when they will droop slightly, and take a most natural and beautiful figure. The perfection of a standard, whether it be an *Azalea* or any other plant, is unquestionably in having a sufficiently dense head, while all the outer branches hang and curve about as loosely and gracefully as possible, provided they do not degenerate into absolute wildness. When, however, a specimen taller than one foot is desired, or when it is required to be peculiarly strong, or is wanted to be reared in a very short time, the best plan of getting it is to graft on stocks of *A. indica phœnicia*. The young grafts can be inserted in the spring, just before they begin to grow, and the plant should be put in a warm shaded house till they are well established. Afterwards, they should be freely cut back, in order to impart bushiness, and otherwise pruned till a proper density of branches is realised.

Either one or several grafts may be inserted on the same stock, at the option of the cultivator; and the scions can be of one or many varieties. We have seen forty different kinds stuck upon the same plant. Although, however, this would occasion a most curious object, one variety will be quite sufficient in point of ornament. A third mode of giving fresh interest to this tribe of *Azaleas*, is by training all the branches, whether of a grafted specimen or one on its own roots, to a single face, so as there to concentrate an extraordinary mass of bloom. Intense and dazzling effects are thus produced.\* To secure good and satisfactory results, this last process should be commenced while the plant is very young, and the branches supple. All attempts to reduce an old plant to this system must necessarily have a forced appearance. A number of stakes should be put

\* This pegging and tying is unnatural and improper, and should be scouted by all good gardeners.—Ed. GARD.

\* This is also a most unnatural mode of culture, and has been too much encouraged. It is mechanism and not horticulture to torture a plant into such one-sided specimens by sticks, and trellisses, and ties.—Ed. GARD.

into the soil, along that side of the pot which is to be the intended front, and the tender shoots must be tied to these stakes as soon as ever they will bear it, with their points standing forward. These points, instead of being fastened up the stakes, in the manner of a climber, should be left to push themselves forward; and, when they become too diffuse, a slight pruning will make them protrude a number of blooming laterals.

"Large lumps of heath-mould, filled with old roots and vegetable matter, constitute the best earth for potting them in; and a few small species of sandstone will be a useful ingredient. Immense quantities of soft water while blooming, a gentle heat during the growing period, and the freest current of air and exposure while they are maturing their developments, will complete the routine." As we have given our principal objections in notes, we have no excuse to make for giving the essence of the paper, but that of showing that there are many ways of accomplishing the same object.

#### PROTECTION OF PEACH TREES.

THERE are few objects look worse in a garden, throughout the summer, than to see a Peach-tree with healthful foliage deprived of its fruit for the want of being protected at an earlier part of the season. There are few places but where they are protected by some means or other, but not sufficiently as they ought to be. When protected with mats, if not taken off every day to allow the sun and air to act upon the blossom, they are as apt to sustain injury almost or quite one way as the other: and too frequently the injury is done before they are covered at all. I would prefer boughs of trees to mats for covering them, for this reason—if the mats are not properly fastened, the wind would toss them about upon the trees, and have the tendency to deprive them of a quantity of their blossom. There are many places where they are left to the mercy of wind and weather; but where that is the case, they cannot depend upon a regular crop.

The plan that I am now to lay before you for protecting Peach-trees is as follow:—I would prefer a north wall with a south aspect to any other, to ensure a regular crop; the face of the wall I would have slated all over with slates as thick as could be conveniently procured, either put up in square or oblong pieces, cemented to the wall with compost and large nails, or anything of a similar kind, to prevent them from coming off. In putting up a new wall the experiment could be tried with more success, as the slates could be built in the face

of it. The reason that I prefer slates is, because they absorb the heat of the sun's rays throughout the day; and as night approaches they reflect back the heat they have absorbed through the day, and that keeps the temperature more regular than it would otherwise be. A wire trellis to run longitudinally along the front of the slates, a space of three or four inches left between the slates and this trellis; and the distance of each wire to be not more than four inches apart. Then to have the trees trained along the front of the trellis; the height of the wall is of little or no consequence; but I would not have it lower than ten or twelve feet, that is to say, if there were a wall to be built on purpose for trying the experiment. The coping of the wall must project over about a foot or fourteen inches, and have an angle of 45 degrees, to allow the rain to pass off freely; and under the extremity of the coping there should be rollers fixed, and to have oil, or wax-cloth, fastened upon these rollers, to roll up and down as necessity requires; the rollers to be placed on pivots at each end, and likewise a small cord fixed to the middle of the undermost roller to pull it down, and to have something of the same kind at each end for raising it up. At night, when the cloth is rolled down, the cold air will be excluded, and the heat that the slates absorbed throughout the day will be gradually given out throughout the night, and form a more regular temperature.

If the slates were coloured black it would add more to their absorption than they would in their natural state. A small piece of a wall might be tried by way of experiment; the expense would not be great, as the cloth could be purchased at a mere trifle; and as it is not required throughout the winter, it might last for five or six years. The cloth could be let down in very warm days, when there is much sunshine; it would serve to protect the fruit against being scorched with the sun. And the coping would protect the trees from snow and cold rains, which would enable them to set much readier; and, besides, one might always depend upon a good crop; that is to say, if the trees are in a good state.

Peaches, in my opinion, could be grown as above-mentioned almost to the same perfection as they could be grown under glass, provided they were rightly managed. For instance, there might be a boiler at one end of the wall, and have a three-inch pipe to extend along a cavity at the bottom of the wall, and to return in the same manner. A small fire in the evening would serve all the night, and the expense would be nothing in comparison to glass. In a family where much fruit is wanted, this plan should be adopted; there can be either less or more of a wall done in this form, for I

am confident of its success. It would likewise do well with apricots, to have them a month earlier than from the open wall.—D. HAY.

#### PANSIES AS FLOWER-GARDEN PLANTS.

WE have always fancied the Pansey for its easy adaptation to all the purposes of dwarf flowers, and for the brilliant colours which may be found in the same flower; bright blue and yellow, or dark and yellow, bright blue and white, or dark and white; give a life and spirit to a group of them, when all of a kind are kept together, and when judiciously mixed they are still more striking. Mr. Paxton does not coincide with us exactly in his notions of their use. The following is the plan at Chiswick. We, of course, leave out all the directions for their propagation. Our own are much better, and much more easily understood. Mr. Edwards, of Devonshire, is the contributor of the paper, but it appears in Mr. Paxton's work. He says:—

“From the constancy of one or two colours in some of the varieties of Pansy, from their lowness of growth, tendency to spread, capacity for blooming early and long, and their extreme showiness, Mr. Edwards, gardener to his Grace the Duke of Devonshire, at Chiswick, has selected a few sorts for furnishing the flower beds, and as we have repeatedly been pleased with their appearance, we think it will be worth while to make the plan public, and explain how and on what particular sorts it is rendered most successful. In doing this, we shall give the details on which Mr. Edwards has kindly supplied us with information, premising that the leading feature of the system is the abandonment of that promiscuous arrangement of sorts which, however beautiful it may be in itself—and, to our taste, it has greatly the superiority—is not suited for that particular style of grouping which demands that only one or two conspicuous colours be seen in each bed. As soon as the time arrives for removing them, they must be taken up most carefully, with a scoop-shaped trowel, or small spade, preserving all the soil about their roots which can possibly be induced to adhere to them. Either the autumn or the spring may be chosen for this transplantation. The latter period seems preferable, since autumn planted species are rather liable to be disturbed or injured by frosts; while those removed in spring establish themselves more readily and securely. The middle or end of March, or the beginning of April, is the best season for putting them out, according as the openness of the weather may determine. Previously, however, to Pansies being placed in any bed or border of the flower-garden, such a spot will have to be specially prepared for their reception. To maintain the vigour of these plants, a tolerably

rich manure is requisite in the soil, which should, moreover, be a good substantial loam. The most appropriate kind of manure is found to be cow-dung, which, besides keeping the soil cooler and moister in dry weather, contributes by its porosity to give additional openness to the earth in a rainy season. The application of this manure should, by all means, be made in the autumn, or early in winter. When the beds are cleared of their summer tenants, a dressing of manure should at once be given, and the ground be well dug over, that it may have time to decompose and pulverise the former, before planting commences in spring. At the time of planting, allowance is made for the insertion of the summer and autumn occupants of the beds, by putting each plant far enough apart to admit of another being inserted in all the intermediate spaces. Plants, bedded out in March, begin to bloom almost immediately, and continue in full display till it becomes needful to put in the verbenas, petunias, &c., which are intended ultimately to displace them. When these last are introduced, the Pansies are trimmed and dressed, to prevent them from over-running the ground too much; and this dressing is continued with more or less severity till they are finally destroyed about the beginning of July, or at whatever other period their successors may be fit for filling their places. During all this time, they will be as gay as ever; while they will afford protection to the newly-planted exotics, and give the benefit of that moisture, which their spreading, leafy, and succulent character, retains around them. One principal point to be observed in the introduction of exotics to those beds temporarily occupied by Pansies, is to make the colours of the two classes of objects harmonize as nearly as practicable. Thus, if a blue or a yellow-flowered Pansey has been planted in any one bed, exotics with blue or yellow blossoms are brought in to succeed it; so that, should the exotics begin blooming before the Pansey is removed, the colours of the two may blend, instead of contrasting. The necessary unity is thus maintained. With respect to all red-flowered exotics, however, they have no counterparts among Pansies; and hence, such things as verbenas, when placed in a Pansey bed, must not be suffered to bloom till they are strong enough to justify the entire destruction of the Pansies. The varieties which Mr. Edwards finds most suitable for this treatment are not distinguished by any names. They are merely known by the colours of their flowers:—thus, there is a pale, slaty-blue sort, and one with yellow flowers, another with purple, a fourth with whitish blossoms, and so forth. It matters not, in fact, what particular varieties are used, so that they be of a good showy character, and have flowers

of one colour, or flowers in which one colour greatly predominates. Sometimes, the existence of two colours in one flower will be an attraction rather than otherwise, as is the case in the two or three-coloured lupines, pelargoniums, &c., so frequently seen. Still, the existence of a second colour should mostly be in a milder and softer form. We should imagine, from the infrequency with which we have noticed the adoption of any practice like the present, that it will be regarded as a valuable plan, especially by the cultivators round the metropolis. The chances of getting a fine display of spring flowers for beds are so doubtful, and the trouble so extreme, that a beautiful and permanent and fragrant thing like the Pansey, will be hailed as a most admirable substitute for the more fugitive objects in general use. We would not, of course, be understood to recommend that the whole of the beds of a flower-garden should be filled with Pansies, even though it might only be for two or three of the first spring months. This would produce a sameness for which no amount of ornament could atone. But, where a well-stocked bed of a plant like this was scattered pretty liberally over the flower-garden, the more imperfectly supplied beds of other objects could be tolerated with far greater readiness. And the better class of annuals, particularly such kinds as *Nemophila insignis*, nearly suffice to make up the deficiency in variety of form." Now, we feel quite confident, that for effect, there are none so good as the brightest; and before they are adopted for flower beds, the habit should be well ascertained. The closer to the ground they naturally grow the better, and there are many sorts admirably adapted for the purpose, while others which are fairer show flowers, are taller, and far more straggling.

#### CORRESPONDENCE ON HORTICULTURAL SUBJECTS.

**OLD MULBERRY-TREES.**—In the *Chronicle* of last week the following is the commencement of a leading article:—

"I HAVE a fine MULBERRY-TREE," says an inquirer, 'upwards of 200 years old, and perhaps eighteen feet high, of which I am extremely proud; but on account of some alterations I am going to make in my grounds this autumn, its root will be buried five or six feet below the surface, if the tree is allowed to remain as it is; and I wish to know what is best to be done under the circumstances—whether to allow the roots to be so buried, or, if I shall be obliged to raise them, how, and at what time, it will be best to do so.' As this is a question the answer to which will doubtless interest other persons besides our correspondent,

it seems to deserve a more prominent place than is usually given to such communications.

We know, from experience, that many people, otherwise well informed, believe that roots may be buried to any depth without injury, and are surprised to find, when they act upon that belief, that their plants either perish or grow sickly. Do not we see, say they, that the roots of trees descend of themselves to great depths below the surface; and if so, why should we not also bury them to such depths? And it must be admitted, that if the premises in this case were true, the inference would be true also. But, with great deference to popular opinion, we are obliged to say, that roots never reach far below the surface of the soil, and when they do, it is owing to particular circumstances."

From this, and what follows, the writer treats the Mulberry as other trees, whereas, they are an exception altogether. It has been in so many cases subjected to the proposed treatment, that practical experience informs us the ground about it may be raised with impunity. It has been a favourite practice to raise the soil into a mound, reaching in many cases high up the trunk, and turfing the entire surface of the mound, so that, independently of the convenience afforded in the saving of the falling fruit, it facilitates the mounting of the tree itself. I am inclined to think, that the old wood of the trunk emits roots in abundance, because I have known the limb of a Mulberry-tree to be used as a post, and to strike roots out of the main wood, which must have been twenty years old, and become a tree, at once healthy and prolific. Whether this be the case with the trunks covered up or not, the fact of their being so treated with impunity is well authenticated. The old Mulberry-tree at Worton had a mound placed round it, more than half way up the trunk, and few bore better fruit, or more of it for seven years—that I can answer for.—C.

**PINE APPLES FROM SUCKERS.**—As a good deal has been written on this subject, I beg to mention, that on the same locality, two friends of mine have been trying Mr. Hamilton's plan of growing Pines from the suckers, without removing them from the old plant. One of them has succeeded admirably, and the other failed; but the success in the one case is so unequivocal, that the efficacy of the plan must be admitted; and the failure in the other may have arisen from so many causes independently of the peculiarities of the practice, that it would be unfair to draw any unfavourable conclusion from the circumstance.—A. R.

**PLANTING PINES IN TAN.**—This plan, practiced by Mr. Hamilton, and recommended in his treatise, is variously spoken of by different



practitioners. In the course of my reading in the papers of the present month, I find the following. An anonymous writer, who signs "Judix," in the *Chronicle*, says:—

"Acting under the advice given in Mr. Hamilton's Treatise on the Pine Apple, I planted out, a few days after his work appeared, twenty-four fruiting plants in tan, or rather tan and decomposed leaves, under the expectation that they would produce me some tolerable fruit; but, to my great disappointment, the experiment is a complete failure; and on examination I find the plants have not made a single root into the tan, and even where young roots were formed, they have died off. Now, these plants have neither been too hot, too wet, nor too dry, the bottom heat having been about eighty degrees, which is regulated by a tank, and the material they were planted in was just what Mr. H. would have selected himself, being tan and leaves that had been at work about six weeks, and just in a decomposing state, mixed with about one fourth of new tan, just to give life to the mass. Six lights of strong succession plants were planted out at the same time, eighteen plants in tan, and the remaining eighteen plants in soil; the plants in tan turned yellow in a fortnight, and have made a poor sickly growth, while those in soil have grown in great luxuriance, and will shortly show fruit."

With regard to the effect of tan upon the roots, there is a period of decomposition, when they luxuriate beyond measure, as all who witness the advance of a plant that has struck through the pot into it can vouch; and in this case it is manifest there was something highly deleterious in the tan. Another writer, Mr. John Haywood, of Summer Hill, near Newport, Salop, says:—

"About a month back I called upon Mr. Hamilton, who immediately called my attention to a stock of Pines, saying—"You see I have improved in my practice since you were here last"—it being then six years since I saw him—and, taking me to a pit of plants—one half of which were in pots, the other half turned out of the pots, and planted in the tan, he said, "Do you perceive any difference in this pit of plants?" "Yes," I replied; "this half (pointing to those that were planted out) are a year older than the other." His answer was—"No; they are all of the same age; and these were planted out the first week in March last."

Here, then, is a confirmation of the efficacy of the practice, but there must have been no tricks played with the tan. If there have been any plants in it or on it watered with any of the chemical liquids, or gas water, or other liquid than pure water itself, and the tan has got saturated with it, there is no doubt it would be

fatal to any thing planted in it; and I have no doubt—in fact, there is no doubt but the tan in which "Judix," whoever he may be, failed, has some deleterious quality unusual in the tan, appropriated generally to the purposes of horticulture.—D. Y.

**THE IMPORTANCE OF DESTROYING THE FEMALE WASP.**—These founders of whole colonies of a very troublesome and destructive insect, are said to frequent the common laurel in the spring months. This may be useful to those who take time by the forelock and hunt them betimes; many people give the men about their grounds a considerable price for these female wasps before they make their nests, and were this generally done, the insect would be almost extirpated in a comparatively short time.—M.D.

**EARLY PEAS.**—All the gardeners with whom I am acquainted, seem to admit that this old variety called the Early May, has been sent out as new peas under several names. J. B. Whiting, has found that the Early May sown at the same time as Farne's first early, was ready to gather a week before it, and identifies it with Cormack's Prince Albert, and Clutton's Early. Now, as well as I remember, the Early May was a shy bearer, and by all accounts Prince Albert is not.—S. W.

**LADY ALLICE PEEL, AND MRS. BARNARD PICCOTEES.**—As I bought the former of these entirely on account of its being warranted superior to the latter, which with the single exception of the small number of petals, is the most beautiful variety we have, I am a little mortified at finding that in the main properties it is worse. In the first place there is a green or yellow colour all over the white, as if the flower were only half come to its colour; in the second place the edge is very much more serrated, and in the third place the petal is inferior in size and texture. I do not mean to throw it away because it will occasionally make one in twenty-four. I only protest against the high character given to it, the assumption of its superiority over Mrs. Barnard, and the high price demanded for it.—D. A.

**PROPERTIES, &c. OF THE CINERARIA.**—I congratulate you on the spread of your notions upon this subject. In France your standard for this flower is well received, as the following will show. *Le Revue Horticol*, from which an extract is published in the *Chronicle*, says, "These beautiful Cinerarias, some of which have been obtained from seeds, in Belgium and also in France, will serve as new types from which to obtain, by judicious fecundation, farther improvements in this beautiful genus. Regarding the qualities of the Cineraria as a florist's flower, I have remarked for some years at the exhibitions of Brussels, Ghent,

Malines, Liège, and Antwerp, that skilful florists attach the greatest importance to those kinds which carry themselves well. They prefer those which flower abundantly, and whose flowers are large and well-made; that is, whose petals are nearly broad enough to fill the spaces between them. To these qualities a good variety should also add beauty of tint, and richness of colour. The improvements of which Cinerarias are susceptible, consist in obtaining the petals broader, and having novelty of lively and brilliant colours, and at the same time possessing the qualities above-mentioned." It is gratifying to observe that the hints about improving the form, are taken from your article on the subject. From the same source may be taken an article on its culture, but there is nothing which you have not already told us.—T. S.

**HUMPHREY'S COMPOUND.**—As this has been most violently attacked in one of the garden newspapers, and an attempt has been made to deteriorate the value of it, I send you the remarks of one of the contributors to the paper which attacked him. He says to the Editor of the paper, "If your remarks were intended to convey the impression that in consequence of the absence of phosphoric acid, his Compound was of no value, I am bound in fairness to say that I have made some experiments with it, which show that it does possess fertilising powers of a very powerful character. They may arise from the nitrate of ammonia, and he may charge an extravagant price for his mode of making up that material: I am not able to speak on those points. But I can say that on the 22d June, I applied the Compound in the proportion recommended on the label, to a *Petunia*, *Verbena*, *Fuchsia*, *Pelargonium*, *Campanula*, *Pultenæa stricta*, and though only one application has been made, the invigorating effects are most visible." I am no friend to these Compounds, because I can make my own liquid manure as well as any of them, and I prefer the sound healthy growth which I can obtain my way without risk to the excited growth which more violent, and in consequence more dangerous, applications produce.

**CONIFERA OF JAPAN.**—I send you a few lines on this subject, abridged from Siebold. I see it has been mentioned elsewhere. *Abies leptolepis* of Siebold—a dwarf kind of Larch, and the same as *Larix sibirica* of Drs. Ledebour and Bunge, but a very distinct species from that found in most English and foreign collections under that name. It is very dwarf, probably never growing more than three or four feet high; and forms a dense bush, with the leaves and cones as small as those of the American Larch. The Siberian Larch, described by Mr. Loudon in his

last edition of the "*Arboretum Britannicum*," p. 1054, is a very distinct kind from that of Dr. Bunge, and is, as is there stated, only the Russian variety of the common Larch, with the branches more robust, but much less numerous. It is to be found in most collections under either of the following names:—*Larix sibirica*, *L. archangelica*, or *L. Rossica*. The *Abies sibirica* of Dr. Fischer is a very different species from either of the above, and is the same as *Abies pichta* of the "*Arboretum Britannicum*," and belongs to the silver fir section. The authors of the "*Flora Japonica*," in describing this curious little plant, which always comes true from seed, should have adopted the name of *Larix* for that of *Abies*. *Abies tsuga* of Siebold.—This is the same as *Abies dumosa* of Lambert, *Abies Brunoniana*, Lindl., and *Abies subdecidua*, Wallich. It belongs to the same section as the Hemlock Spruce, which it very much resembles, and, like that species, only forms a large bush, or small tree, from twenty to thirty feet high. It still remains to be introduced, and would prove, no doubt, quite hardy. *Abies firma* of Siebold.—This belongs to the *Picea*, or silver fir section, and greatly resembles in foliage and habit *Abies pichta* (*Abies sibirica* of Ledebour), but differs very much in the cones; the cones of *Abies firma* having the bracts considerably longer than the scales, while those of *A. pichta* are not so long as the scales. It is said to be a tall tree, and no doubt quite hardy; and probably only a northern form of the *Picea pectinata*, which still remains to be introduced. *Abies homolepis*.—This very much resembles *Abies Smithiana*, of Dr. Wallich, both in cones and branches, and most probably is identical. The scales figured quite agree with those of Dr. Wallich's *A. Smithiana*, in the uneven margin and smaller size. It is said to be a tree from twenty to thirty feet high, and belongs to the Spruce section; it remains to be introduced. *Abies bifida* of Siebold.—This is the same as *Picea Webbiana* of the "*Arboretum Britannicum*," and is the *P. spectabilis* of Lambert, and Chilrow of the natives in the Himalayas. It belongs to the silver fir section, and is one of the most ornamental of the whole race of Pines, having beautiful large purple cones and silvery leaves. It forms a large tree in the Alps of Gossanthen, from eighty to 100 feet in height.—*Gatherer*. These will be interesting to those who are pursuing the cultivation of the Coniferae in collections.—A.

**WHITNEY'S COMPOSITION.**—Calico is not calculated to last long, and Irish linen seems never to be the worse for wear. There is, a little rivalry between the compositions. We cannot spare any light, even from Whitney's, which is, at all events, the brightest.—M.

**MR. MURRAY'S SYSTEM OF HEATING.**—This has already been described; it has, however, produced some differences of opinion, and, among the rest, a letter from Mr. Glendinning to the *Chronicle*, of which letter the following is an abridgment:—

"The system of heating described by Mr. Murray in last week's *Chronicle*, appears to me as objectionable as the old flue mode of accomplishing this, without its advantages, and scarcely reconcilable with our present knowledge of the subject, at least if I rightly comprehend his plan. It appears to me objectionable to place the heated air at the back of the house; our common notions on this are to place the flue or chamber as near the front as possible; that would be fully recognising the principle which Mr. M. lays down as the basis on which his system is founded, as the coldest air is at the front of the house; but how is this air set in motion does not appear intelligible by the plan. The second objection which strikes me as fatal to his system, is that of "admitting fresh air from without, keeping up a healthy atmosphere," as indicated in the plan at C C. Now, how does the air become unhealthy? Why, by the noxious gases which escape from the stove, as there can be no other means of contaminating it. Air is the same in all cases, un less it is rendered unwholesome by the decomposition of some material, such as tan or dung, or the noxious impurities generated by flues. If hot water was used in the same house, it would be quite unnecessary to think of admitting air from without.—*R. Glendinning*. I can answer for it that Mr. Glendinning is wrong about the noxious impurities.—D. D.

**PRUNING FOR TRANSPLANTING.**—Except where unavoidable, (as in the instance of the wild stock,) a tree should not be topped root and branch at the same time; the double mutilation is injurious to it. Thus, half of each branch is continued, to keep up an intercourse with the root, and, when an action is established, cutting in the head is desirable. On removing trees, the fresh roots they have made, and the appearance of those which were left, will require attention in the application of the knife; in pruning a large root it should be cut to a lateral—in shortening a small to a fibre; where a plant has been examined and trimmed so recently, however, the knife should be sparingly used. And it may here be well to observe, that all cuts to remove branches, knots, or roots, should be quite clean, slanting (and deep enough to the stem, viz. even with it), and nothing left projecting, lest dead wood be the consequence, and the plant be eventually injured; all wounds should be carefully healed, and dead wood should, in all cases, be re-

moved, and living bark encircle that which remains. The removal of the extraneous parts of the wild branch, and the stem left above it (if any), as subsequently directed, are best effected 18 months after budding, in March; if sooner, the bud is apt to be injured, as well as the wound left uncovered; but at this time they may be cut down to the base of bud and branch, and the mixture will secure the wound from injury. All summer and spring-made wounds, if clean cut, will partly cicatrize over the same year, and, if defended while in progress, will not do any future injury. This lesson is from the *Rose Garden*, published some years since, and republished lately in a paper of the present time; my object in bringing it to your notice is, to give my own opinion that Roses are the most difficult of all plants to kill or even injure, and thus I have had hundreds to plant out which have been on board ship for weeks out of pots, and knocked about and broken to pieces, so that I have been obliged to cut off roots and branches alike, to make them clean, and yet they grew well.—*Rosa*.

**WIRE WORM AND WHEAT.**—It happened at Nailsea, a village near Bristol, that a gentleman planted a ploughed piece to wheat. It came up exceedingly well, and looked very healthy for a week or two, when it began to wither, the gentleman could not account for it, he pulled up two or three blades, and found the Wire worm had eaten nearly all the roots, so he determined on ploughing the whole piece in and sowing it over again. He accordingly did so, but sowed at the same time Guano with it. He has lately cut one of the finest pieces of wheat any where in the neighbourhood. Giving an instance of Guano being a good remedy against wire worms. Thinking this might be of some service, I have thought it right to make you acquainted with it.—*A Subscriber*. P.S.—Is there a description of gourd called vegetable marrow? \*

**GUANO IN A LIQUID STATE.**—Many of our readers are aware of the ravages made by an insect, we believe of the *aphis* species, on culinary vegetables this season, the effect of which is termed "mildew, blight, blast," &c.; we cannot at present be so explicit as we think necessary as to the name, history, &c. of the insect; but we have ascertained by a series of experiments, a remedy for its destruction and restoring health to plants infected with it; it is, 1 lb. of *Peruvian* guano to 16 gallons of soft water, and when it has lain six hours, water the plants (by use of a water pot with rose) or vegetables copiously with it; a second application should be made

\* All vegetable marrows are gourds.

of the liquid if necessary, but we have not found it to be so.—The foregoing is from the transactions of the Irish Gardeners and Stewards Society for Mutual Instruction.

**BURLINGTONEA RIGIDA.**—Naturally *B. rigida* grows during the rainy season in the humid forests of Brazil, sheltered from the blaze of the sun by a thick canopy of foliage; and its peculiar character and the position of its roots, place it beyond the means of acquiring other nourishment than that which floats in the atmosphere or falls from the heavens. From these facts we may reasonably conclude that during the same season in an artificial climate a large amount of aqueous matter is not only necessary but indispensable. In no place have we seen more healthy specimens than in the nursery of Messrs. Loddiges, of Hackney. The plant is grown in a basket formed of shells, fixed together with wire clasps, and filled with decaying moss, concealed from view by a verdant covering of growing *Lycopodiums*. The looseness of the material, and the open nature of the basket, allows water to pass away with great readiness. A trellis formed of four strong, upright wires, with smaller ones twisted spirally around them, supports the plant, which, it will be recollected by those who have seen it, has pseudo-bulbs, distantly separated by long, wiry, ascending rhizomas, and numerous long white roots protruding from the base of each. During the growing season, the plant is placed in a warm house, and near it a pipe, one inch in diameter, from an elevated cistern of tepid water. This pipe is pierced with an extremely small hole, from which a fine *jet-d'eau* rises a little higher than the plant, and beats upon a piece of glass placed over it, which precipitates the water upon it in a fine spreading, dew-like shower, that trickles down the numerous roots, and hangs in pellucid, pearl-like drops at the extremity, undoubtedly furnishing them with an abundance of nutriment, and that more constantly than when dependent for it alone on the atmosphere and occasional syringings. It is hardly necessary to observe, that this spray-like stream is only applied during the season of the most active growth, and is then accompanied by a proportionately warm temperature; as the bulbs attain perfection, it must be gradually withdrawn, and wholly withheld as the season of torpidity approaches. During winter no more moisture is necessary, or indeed useful, than merely sufficient to maintain the pseudo-bulbs in a plump unshrivelled state. Probably, some similar contrivance to this may be successful with other Orchidaceous plants of difficult management, which grow and flower during the rainy season in their native clime. Mr. Paxton's notice of Mr. Loddige's mode of growing this plant reminds us of the contriv-

ance for throwing water all over plants like a dew almost; it is very simple: a pipe goes all round the house at a considerable height, into which water is laid with some pressure, holes of a small size are bored all along the pipe, which, when turned on, throws the water to the very centre of the house, as small as dew.—L. S.

**SOLANUM CRISPUM.**—Few people are aware of the beautiful *Solanum Crispum* being perfectly hardy, and I was not, until turning over some of my old numbers of the *Botanical Magazine*, I saw the following notice of it:—" *Solanum Crispum*—*wavy Solanum*.—Class and order. Pentandria Monogynia. Natural order, Solanace. Apparently a frequent inhabitant of Chili, growing in waste places; as at Conception, Carcamo, and Palomares, and also in the Island of Chiloe, whence it seems to have been introduced to our gardens by Mr. Anderson. It was suspected it would prove a hardy plant; and such is the case even as far north as the Highlands of Argyleshire, where, in the gardens of James Hunter, Esq., of Hafton, a most indefatigable horticulturist, there is a plant which has attained to a height of from twelve to fourteen feet upon a south wall. It has braved the unusually severe winters of 1837-8 and 1838-9, and it is hardly possible to conceive any thing more beautiful than the numerous purple corymbs, backed by the copious dark foliage, which the plant produces throughout the summer months. It strikes freely from cuttings." Since this I have grown it in the open garden with much delight, and persuaded all my brother amateurs whom I have met to do the same—in short, it ought to be in every garden.—V.

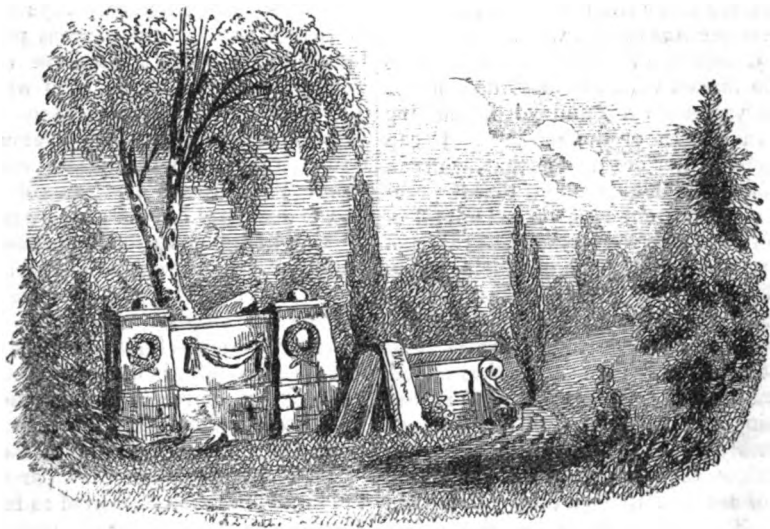
**MOSS ON LAWNS.**—I have followed some advice, which I believe has been often given, but not tried for want of faith in it. On a lawn which had been a good deal covered with trees in its time, the moss was thick, and smooth as a carpet. I almost agreed with some people, who thought a moss carpet as pleasant as grass, but orders were given to clear it somehow. I had read the following:—"Apply a top dressing of wood ashes, in the proportion of 160 bushels to the acre, or thereabouts. I would not recommend it to be done in summer, as it will be too soon dissipated by the heat. Spring or autumn is the best time; if done in autumn, the ground, the following spring, should have a top dressing of rotten dung, or other rich earth, mixed. If the ground is wet, draining will be highly necessary. It will thoroughly eradicate the moss, and bring the herbage of the most beautiful green colour and fine texture." This was clear enough; but I wanted faith; nevertheless, I did not fancy waiting till autumn. I accordingly, in the month of June, sowed the wood ashes, and dressed immediately with road

sand, which was evenly spread, watered, and rolled. This watering I continued for several days. I soon observed the effects; the grass sprung up, and with it a good deal of white clover, but long before autumn arrived I had a handsome lawn, with an even and good bottom. I think the road sand, by getting in among the moss, makes the growth of grass more rapid, while it keeps down the ashes, forms an even bottom, and, when watered and rolled, does away with all the objections to performing it at midsummer instead of michaelmas.—M. S.

**THE FUCHSIA FULGENS.**—In turning over a back volume of a newspaper of 1837 or 38, I found the following notice:—"This plant has become common in most collections, and we shall next be overrun with hybrids of all shapes, sizes, and we had nearly said, colours, but all the hybrids from this class seem to want colour; every alteration and every stage of difference between the old and new, seems to us to degenerate in proportion to its distance from either or both of the species. Every remove from the globosa is an approach to coarseness, and every departure from the original fulgens, seems at the expense of the only beauty it pos-

sesses—the vivid scarlet." How true does all this appear even in the present day, how many scores are there which have not a single good property? There is no contrast, no symmetry, no brilliance, nothing but ragged coarseness characterizes nine-tenths of all that have been sold. *Formosa elegans* is still the best, *Vinus Victrix* the prettiest, *Ricartoni* the finest corolla, *Globosa* the finest habit and best looking plant in all stages. I want to see *Smith's Queen Victoria*, but he keeps it in till something will beat it in the same way, and then it will be worth nothing. Your properties of the *Fuchsia* have properly opened our eyes and thinned our collections.—C. T.

**USE OF THE WALNUT TREE.**—Walnuts yield half their own weight in oil, whose flavour is considered equal to that of the finest Lucca oil. This very fruitful tree, which we see flourishing along the high road, and in the orchards of the peasants, is one of great utility to the German; his furniture is made from it, the leaves dye a good black, and he feeds his cattle with the shells of the nuts that have supplied his oil. This is leaving out of the question its use as a nut.—G.



#### GARDENER'S SKETCH BOOK.—NO. IV.

THIS sketch would be greatly increased in interest, had the particulars of the scene been described; it is, however, without any memorandum beyond the fact that it is a portion of remains carelessly set up in the neighbourhood of some more formidable ruin. In many gardens we have observed specimens of sculptured capitals, cornishes, bases and portions of pillars, set up or heaped together, or distributed about. The pride of the owners being

that of boasting that this come from Athens, that from Tripoli, or the other from Herculaneum or Pompei, but it will be easily discovered that every stone-mason's yard would furnish much more appropriate specimens of mere masonry, if there were no charm about the supposed origin. The inconsistency of such appropriation without an object is very great, unless the greatest care be taken in the choice of the subject. A portico, or the suffi-

cient remains of one to retain the principal features is a feature worthy the most beautiful spot in the grounds, and of one of the best views from the best room in the house. It could always be made the entrance to a substantial room, to be used as a summer-house, and be worth the addition. If judiciously planted, the grounds immediately about would be extremely interesting.

#### THE GARDENERS' AND FARMERS' ENEMIES AND FRIENDS.

I WISH to bring under your notice the patriotic exertions of an anonymous writer, who has made a strong appeal on the subject, in a circular or tract, called "a Few Words on behalf of Birds supposed to be Injurious," in which he pleads strongly for the feathered tribe, and condemns the folly of destroying some of the most useful. In his preface he says: "There is now before the writer a notice (1836) that, in future, the expenditure for the destruction of sparrows shall not exceed two pounds annually. This is recorded in the minute-book of the trustees of a charity estate, left nearly three hundred years ago, some of whom were of a rank in life to have known better. Such is the abuse to which the funds of too many charities of this nature are liable from neglect or inattention. One important benefit will be gained by an improvement in this respect, that the ears will not be dinned with the discordant noises from little voices on a Sunday! frightening birds from the corn or the orchard. It can scarcely be a matter of surprise, that, while in earliest youth the child is taught that the preservation of a few cherries, or a handful of wheat, is to be preferred to the observance of the fourth commandment, in advancing years he should practice this neglect on a more enlarged scale. The general excuse given for absence from the Sunday-school, according to the phrase which prevails here, is, that he has been 'bird-keeping' for Farmer So-and-So. On speaking to the parents on this subject, they generally regret it, but state that if they were to refuse the children on the Sunday, they would not be employed during the week.—J. M." The author begins with those birds which the gamekeeper almost always destroys under the head of vermin; such as:—

**THE COMMON HERON.**—The animosity prevailing against this fine bird arises from his frequenting the ponds for a few small fish. For this offence, he falls a prey to the gun of the keeper, and the miserable emblems of his success greet the eye, nailed against the barn-door, or other more convenient site. Thus, for the preservation of a few fish, is this noble bird allowed to fall a sacrifice to ignorance and cruelty.

**THE KESTREL, or WINDHOVER.**—Of course the whole of the hawk tribe fall under the ban of the keeper. The species mentioned above, is that which chiefly prevails in this locality, and whenever the gun can reach him, he is a certain victim. In addition, the nest is eagerly sought for, the young taken, and too frequently with a piece of wood chained to the foot, may be seen one of those in misery, hopping, as well as he can, to scare smaller birds from the produce of the garden. The utility this bird confers, by the number of mice he destroys, is, of course, never taken into consideration; he is "varmint," as the keeper phrases it, and that is enough. His utility from his mice-destroying propensities has been well described by Mr. Waterton. He is a feeder, also, on the cockchafer, but all is of no avail, death awaits him whenever he comes within range. Those who have witnessed his beautiful action when hovering over a field in search of his prey, cannot too deeply regret a course which, if persisted in, will ere long deprive them of this pleasure, at least, in the neighbourhood of large game preserves.

**THE WHITE, or BARN OWL.**—Another species, the victim of all who, ignorant of his value, can get a shot at him. "As a constant destroyer of rats and mice," says the historian of British Birds, "the services performed by them for the agriculturist have obtained for them a toleration which they well deserve." The number of mice this bird must destroy is very great, as a vigilant observer has seen him return to his nest with his prey every five minutes. The gardener complains of the destruction of his early crop of peas by mice, but the feels no hesitation or remorse at having a shot at the bird who would be of essential service to him in preserving his produce from these depredators.

**THE MAGPIE.**—This singularly beautiful bird is, unhappily, in the doomed list. But for its habits of extreme caution and sagacity, very few would survive the keeper's enmity. With perhaps a little truth in its reputation for depredation amongst a few partridges' eggs, and in all probability resorted to in absence of other food, this aberration is more than compensated for from the incredible number of grubs and slugs which it destroys. In France and Sweden it is never molested; with the Norwegians they are especial favourites.

**THE JAY.**—Having the reputation of being partial to the eggs of young birds is quite enough to include this beautiful bird in the list of destructives; its principal food, however, being acorns and beech-mast.

**THE ROOK** has been omitted, as it is believed that farmers have now become sensible of the advantages they confer, and instances

are known, that where, in their ignorance of the utility of the rook in clearing their lands of grubs, &c., they have prevailed on their landlord in getting the rookery destroyed, in a very short time, finding out their error, they have earnestly entreated for its restoration. Still, the eye is too frequently disgusted in seeing one of these birds suspended in the field, under the idea of saving a few miserable potatoes, &c. &c. If the money spent in powder, pay of boys kept from school, and the original cost of the gun, were expended in teaching net-making to those in the parish who are lame, or otherwise infirm, a saving would be obtained, and a moral benefit conferred. Too much praise cannot be awarded to the benevolent exertions of the late Rev. Charles Bathurst, for introducing this art into his parish, superintending it personally, and for the little volume which records his proceedings, with the mysteries of the art of reticulation.\*

**THE THRUSH.**—In our list is, we grieve to say, this early harbinger of spring; and insensible to the benefits derived from the number of snails he destroys, woe betide him if he ventures to help himself to a solitary cherry. During the prevalence of the unusual dry season (June, 1844), the thrush was driven for food to the holly-bush for its berries, and we grieve to record that sixty of this cheerful songster fell a sacrifice to the gun on a Sunday! In the summer when wasps and other insects have full possession of the garden, this proceeding, the mixture of ignorance and cruelty, will bring its own punishment.

**THE BLACKBIRD.**—It is grievous to think that this bird, whose melodious voice gives such pleasure to the ear, and lends a charm to the ramble through the grove, must, for the sake of a little fruit, meet with the usual persecution. Its food, in spring and early summer, consists of the larvæ of insects, with worms and snails. The enormous number of slugs and snails, so injurious to vegetation, which are eaten by blackbirds, should at least save him, on the score of gratitude, from the general destruction.

So much for the birds distinctly named, but in the utter ignorance that prevails of the benefits conferred by these beautiful creatures, with an equal ignorance of the food on which they subsist, it is hardly to be wondered at, that many who venture into the garden in search of insects, and other animals injurious to vegetation, alike fall victims to the indiscriminate slaughter vowed against every bird that approaches the precincts. In some little abodes every encouragement is given to their presence. A neighbour once inquired how his lawn was so disfigured with worm-casts, while

that of the writer's was so free? The answer was ready: "Leave off popping at the worm-feeders from morning to night, and your lawn will present an equally pleasant appearance." It is an agreeable sight in early morning to view the activity of the blackbird, thrush, starling, and others, vigorously tugging the struggling worm from his retreat, more especially if it should happen that the grass be covered with dew. It is very true that some little fruit does fall to their share; but so grateful is their cheerful voice, and their interesting evolutions in search of food, deeply would the exchange be deplored that should deprive us of their presence for the sake of a little fruit."

Nothing can be more senseless than the indiscriminate destruction of birds at all seasons. We once observed half a dozen chaffinches working hard in a cherry tree before the blossoms were quite open, and shot one of the birds. It was in the act of swallowing a grub, which was half hanging out of its mouth, but it cured us of our warlike propensities.

#### THE NECESSITY OF CONFORMING TO THE AUTHENTICATED PROPERTIES OF FLOWERS.

WE might fairly remonstrate against all societies and persons who adopt our properties of flowers, without acknowledging them; and others who make silly alterations, without giving any reason, or even saying that such things as laws to govern us in the estimating of a florists' flower, exist. We have seen a very well intended, perhaps, but very imperfect and summary of the properties of flowers, published by a society, which ought to be called the society for promoting disunion and confusion in judging flowers. This summary is not wanting in number, or in minuteness of the points by which a flower is to be judged; for the greatest pains seems to have been taken to render the lesson puzzling, if not unintelligible. Some of the main points in our "properties of flowers" are retained, with slight alterations in the wording; some are taken bodily as they are found; some are altogether novel and useless, if not mischievous. Various communications have been made to us about this attempt to undo what we have been doing. Every society, and every individual, who has any valid objection to the properties we have published, is bound to give a reason for every deviation from the authorities generally acknowledged, and it behoves all those who think our notions are right—and who are, in fact, acting upon them—to come to an open vote, that their standard for judging florists' flowers and plants shall be that published in *The Gardener and Practical Florist*. This will at once strengthen the au-

\* Notes on Nets.

thority. It is not enough to act upon them, but the world, also, should know that they are acted upon, because it enables people to learn by reading what they are expected to win with. Now, if here, a society patronizes any other authority, without good and sufficient reason being given for the change, science is damaged rather than advanced by the confusion it creates. If there be no difference in the points considered to be best by the society, and those already pronounced best, it is dishonest to this work to adopt them without acknowledging them to be so; and still more so, to alter the language, as if it were all new, and keep the actual points the same. We, therefore, suggest to those who wish to fix the properties published by us as the standard (and hundreds implicitly rely on them we know) to come to an open vote at once, that the "properties of flowers" published in this work are a proper standard, and those who disapprove should come to a vote of the contrary sort, and give their reasons for it. The public would then be able to judge between them.

#### DR. MURRAY'S LECTURE ON EARTHS.

THE first and most important of these is lime, which exists in nature principally with carbonic acid: it is best known by its property of effervescing when an acid body is applied to it; if we take a piece of chalk, and pour any acid upon it, we see a boiling up, which is caused by the disengaging of the carbonic acid which escapes in the shape of air or gas; the effect of carbonate of lime in the soil depends upon its furnishing lime to the plants, and upon its action on organic matter: it acts in various ways; when limestone is burnt with coals, the carbonic acid is expelled, and the pure lime alone remains; it loses in this way, in weight, 44 parts of the 100, for when limestone is perfectly pure, it contains 56 of lime, and 44 of carbonic acid; quick lime has a strong attraction for water; when it absorbs water, a great heat is produced, and the lime separates and falls into a powder, perfectly dry; it is then hydrate of lime, that is, a compound of the pure earth, lime, with water; it possesses the power of changing vegetable colours to green, hence it has sometimes been called an alkaline earth. Lime in the caustic state does not occur in nature, for whenever pure lime is exposed to the air, it attracts water and carbonic acid, and becomes what it was at first—carbonate of lime; this change takes place in all cases where lime is applied to the land, more or less; nor is this change without benefit; by thus combining with carbonic acid gas, it forms a powder in a far finer state of division than

we could get it in any other way, thus enabling it more easily to intermix with the soil, and enter the roots of plants. Lime is a compound body, consisting of the metal calcium with oxygen; it is similar in composition to the alkalies; when common limestone is dissolved in muriatic acid, it yields a solution called chloride of calcium; the salt exists in large quantities in sea water, and in boiling down the sea water to obtain common salt, the muriate of lime forms a liquor which is found very advantageous in one instance as a top-dressing, particularly to the potato crop, the shaws have been increased to a height of six or seven feet, and some single potatoes reached a weight of two or three pounds; it should be applied to the land in a much diluted state. Sulphate of lime exists in the lime liquor of gas works, and has been used with advantage as a top-dressing. When organic matter is in a state of putrefaction or fermentation with gypsum, this body appears to decompose the gypsum; it is occasionally found in the soil and in mineral springs, and it is contained largely in the waste heaps of the alkali works; when judiciously applied, it promotes the growth of those plants which contain sulphur; by using it in a diluted state as a top-dressing it increases the product of plants considerably. Sulphate of lime, or gypsum, is an abundant mineral; it is found in beds to a considerable extent in almost all quarters of the globe; it is an ingredient of waters which have percolated through the soil, and is found in the ashes of plants. Gypsum contains about 21 per cent. of its weight of water; this it loses by heat, but when mixed with water it again combines with it and forms a hard body; it is necessary to burn gypsum to apply it to the land; its use is principally to promote the growth of those plants which require sulphur; it also acts upon those soils which are deficient in lime. Nitrate of soda is supposed to be a much more general ingredient of soils than has been thought, but it is difficult to detect it in consequence of its solubility in water; it attracts moisture from the air, and it is easily carried into the subsoil or washed away; it forms a valuable manure, but no process had yet been found out by which we can obtain it at a sufficiently cheap rate to use it economically. A very important compound is that formed when phosphoric acid unites with lime; phosphate of lime forms several compounds; one of the most important of which is bone earth, which is the substance that remains after bones have been made red hot; the greater part of the animal matter has been burnt out, and after the bones have been thus burnt, the residuum consists of phosphate of lime, principally; this is in the proportion of 51 of lime to 49 of



phosphoric acid; it exists in the bones of all animals, but in different quantities; it is smaller in young animals than in old ones; as the animal increases in age, the animal matter becomes deficient, and in very old animals the earthy matter is greater in proportion; hence, their bones easily break and are more difficult of uniting than those of young animals; the phosphates form about 57 per cent of dry bone, the quantity is different in different parts of the animal; it is least in the horns, hoofs, and nails, and greater in the solid bones; phosphate of lime is present in the seeds of cultivated plants, and in their ashes; as animals, after death, are commonly buried in the soil, we easily see that it should be in all soils; in some soils phosphate of lime is much more abundant than in others; on those which are deficient in it, plants will not thrive; this may be regarded as one great principle on which the use of bone dust chiefly depends; bone earth is insoluble in water, and also in the alkalies; it is soluble in muriatic acid, and when in a state of fine division it is soluble in carbonic acid; thus it is presented in the state most fitted to enter into the vessels of plants; if we take bone earth in a state of fine division, and add carbonic acid, the phosphate of lime is rendered completely soluble, and in this state it is presented to the plants; if we heat this the carbonic acid is expelled, and the phosphate of lime would be again insoluble. In bones the substances associated with lime are gelatine and fatty matter; by boiling the bones these can be extracted, and in Germany they are extracted to form glue; again, the earthy matter can be extracted, leaving the gelatine and fatty matter, by the use of the acids; if bones be placed in an acid for two or three days, the earthy matter is drained out and the cartilage remains; in Germany boiled bones have been used in agriculture, but their effect is not lasting. Another compound of phosphoric acid and lime is superphosphate of lime, which contains twice the quantity of phosphoric acid as bones; it is formed by decomposing bone earth and taking away one half of the lime; if we take a portion of burnt bones, reduce it to a fine powder, dissolve it in water, and then add sulphuric acid, the sulphuric acid takes away one half of the lime, leaving the remaining portion, and all the phosphoric acid; but the phosphoric acid is relatively increased by its larger proportion to the lime in the remaining compound; this compound is soluble in water, which the neutral phosphate is not; it exists in the urine of most animals; it is readily decomposed by the alkalies, the excess of acid uniting with the alkali and depositing bone earth; by adding to it ammonia or any of its salts, we obtain

phosphate of ammonia, which is very valuable as a manure; hence it has been proposed to take common bone dust and act upon it by sulphuric acid without burning it. By neutralising the excess of acids by the liquor of gas works, two very valuable compounds, phosphate of ammonia and phosphate of lime are found. A variety of phosphate of lime exists in nature; it differs but slightly from bone earth; it has been used in a small scale in Germany, and with a beneficial effect. A third compound of phosphoric acid with lime is phosphorate; it forms large beds in Bohemia and Estramadura; as it approaches nearly to bone earth in its nature, it is likely that it may be imported into this country, and is already imported into Ireland. Magnesia is the next earth to be noticed; it is a substance which scarcely exists in a pure state in nature, and is prepared from some of its salts. Carbonate of magnesia exists in considerable bodies; it is found more largely in connection with limestone; when dry and pure it exists in the proportion of  $43\frac{1}{2}$  of magnesia to 51 of carbonic acid; this salt is present in the soil, and it is found in the ashes of a great number of plants; in some of these it forms a sixth part of the weight of the ash; when dry, carbonate of magnesia is insoluble in water, but when converted into the form of a hydrate it dissolves; carbonic acid dissolves it readily: pure magnesia is obtained from carbonate of magnesia by simple calcination; when magnesian limestone is burnt, the quick lime contains magnesia in the caustic state; this has frequently been applied to the land, and it produces an injurious effect; the cause of this injury is not very satisfactorily ascertained, but it is supposed to be from remaining in the caustic state for four or five years; hence this may be one cause of its injurious action on crops; another cause is supposed to be that in the caustic state it more easily unites with the organic acids produced by the decay of vegetable matter, forming salts which are carried down in too strong a state to the roots of the plants; this is the more probable way in which the injury is produced. The metal magnesium is the base of magnesia; chloride of magnesium exists in sea water, associated with chloride of calcium; no direct trials have yet been made with chloride of magnesium; but as magnesia is known to occur in the ashes of grain crops, it is reasonable to suppose that this salt should prove highly beneficial; it is easily soluble in water. Sulphate of magnesia, or common Epsom salts, exists in all soils which are formed from, or exist in, the vicinity of magnesian rocks; in some soils it exists in too large proportion, so that in dry weather it forms a crust over the surface by the evaporation of

moisture; sulphate of magnesia has been found to act in the same way as gypsum; as it is far more soluble than gypsum, it should be diluted with a large quantity of water. Phosphate of magnesia is also an important manure; it exists in most soils, and is more abundant in animal solids and fluids; phosphate of magnesia exists in the ashes of grain crops, but its effects on vegetation have not been directly tried. Alumina, or pure earth of clay, forms a large portion of clay soils; when perfectly pure it will not dissolve in water; it is dissolved both by the acids and the alkalies; although this earth is present in large proportion in the soil, it contributes little to the nourishment of plants; this we see from the minute quantities of it in the ashes of plants; its agency is probably mechanical. Silica is the last of the earths to be noticed; it is a most abundant ingredient of almost all rocks and soils; silica, when pure, is a white powder, without taste or smell, insoluble in water and in the acids, but soluble in alkaline solutions, and when separated from the alkalies it is soluble to some extent in water and the acids; when reduced to dryness it is less soluble than at first; in a minute state of division it is to some extent soluble, and hence it is found in some mineral springs; in the substance of living vegetables silica exists in the form of a delicate tissue surrounding the plants; the inflammable silicon is the base of silica, and silica is obtained by burning it; the compounds of silica are termed silicates; the earthy are insoluble salts, existing in a great number of rocks, and in the stems and leaves of a great number of plants; they are abundant in the stems, especially in straw, and form a considerable percentage of the ash; they are slowly decomposed by the united action of moisture and carbonic acid; in compost heaps these silicates undergo a similar decomposition, and when again mixed with the soil, they are in a proper state to be absorbed by the young plants. Silica unites with lime, and forms silicate of lime; this exists in a great number of rocks, also in soils, and in the stems and leaves of plants; all the silicates are decomposed by moisture and carbonic acid. Silica unites with the two earths magnesia and alumina; these exist almost entirely as the constituents of rocks. The next compounds to be noticed are the metals; two metals are found in the ashes of all plants;

these are iron and manganese. Iron forms two compounds; when exposed to moisture, it rusts and becomes covered with a reddish brown powder, which is called peroxide of iron; when iron is heated and beaten on the forge, dark scales fly off, and these are oxide of iron—containing about 20 per cent of oxygen; it is called protoxide of iron. Both of these compounds exist largely in nature; they are present in almost all soils: the protoxide is most abundant, causing the red colour in many soils; the protoxide seldom occurs in soils, except in combination with acids; in the state of salt it also rapidly changes into the peroxide; iron springs hold these compounds in solution in a low state of oxidation, but in a high state of oxidation they are insoluble in water, and in some of the acids in which they are soluble in a low state; accordingly a portion of it is precipitated, as we see, in the iron springs; both are insoluble in pure water, but soluble in the oxides; it is the compounds of this metal with oxygen that produces the injurious effect in soils where it exists; both these compounds form salts. Iron occurs, also, in combination with sulphur, in two proportions, sulphuret and bisulphuret of iron; sulphuret of iron is an insoluble body, and it is generally found that insoluble bodies do not exert any great action on vegetable processes; bisulphuret of iron is exceedingly abundant in nature, and especially in the rocky formations; it abounds in coal, and is the source of the disagreeable smell of that body in a burning state; it is also the source of the sulphate of ammonia in soot.—Common green sulphate of iron or copperas is found in ordinary soils, but principally in boggy and marshy lands, where it is decidedly injurious; it is easily decomposed; chalk, lime, or marble decomposes it at once; hence the value of lime in decomposing these deleterious salts; it is partly this salt that exists in mineral springs; the ashes of nearly all kinds of plants contain more or less of it. The metal manganese unites with oxygen in various proportions; a small quantity of the brown and black oxides of manganese is to be found in nearly all soils; these oxides, in combination with the acids, form soluble salts; the compounds of manganese exist in plants in much less quantity than those of iron, and this small portion is not likely to exercise much action on vegetable growth.

## GLENNY'S GARDEN PRACTICE.

### KITCHEN GARDEN—SEPTEMBER.

POTATOES which have completed their growth and ripened may be taken up and stored, and

this may be known by the decay of the haulm; but in dripping seasons they will sometimes

start afresh, make a second growth of tubers which will exhaust the original crop. By trying occasionally, the crop it will easily be seen whether the disposition is to ripen or to grow, and if the latter, they are better up. Storing potatoes is a matter of course, but there are many ways of doing so; in families instead of a long pit in which they are heaped up like a bank, they are often with advantage done in cones of something like a hundred weight to three hundred weight, the place chosen is dry, a circle or square is dug one foot deep and cleared out, this is filled, and the Potatoes piled up to a point, upon this six inches thickness of straw is laid, and six inches of earth is placed all over the straw, the advantage of these cones over a long pit is, that one being opened at a time there is no mischief done by the admission of air, whereas if a pit were a mile long, opening one end would admit air to the whole.

ONIONS which are ripe must be drawn on a fine day, and left to dry on the ground if the weather permit, if not, they must be dried under cover, and when dry should be stored in a dry loft which is thatched; but for families where they have to last through the winter and spring, they must be stowed cool and dry, and it matters not where. If an onion loft is made where the roof is slate or tiles, and consequently hot, they will soon be damaged by growth.

CELERY, earth up as usual, and late as it is, if there be any left in the seed bed they may be planted out at the bottom of drills, not trenches.

CAULIFLOWERS.—Prick out the late sown Cauliflowers for keeping over the winter. Let them be under hand-glasses or in frames, or in very sheltered situations, that the winter frosts, if severe, may not kill them. If you have a garden frame, dig a place in a fine sheltered spot, and dress it well, if it be not already rich; there prick out the plants in rows, three or four inches apart. When you have filled the space, lift the frame over them, and put on the glass. This must be managed all through the winter in such a way, as to give the entire benefit of the air, except in frost. They may be wholly uncovered, except when the air is actually frosty. If they are covered with hand-glasses, it will only be necessary to mark the space you may fill, by pressing down the glass on the surface, and you must plant in the same way. If they are to be covered with hoops and mats, or, which is far better, hoops and transparent calico, the only necessary point to attend to is, that they are sheltered from the north and east winds.

CABBAGE PLANTS.—Plant out these in rows in all spare ground, the rows fifteen inches

apart, the plants six inches. When they are large enough to bunch for greens, take two, and leave one, all along the rows. The two will do for colworts to cut, the third will do for early cabbage.

WINTER SPINACH that is well up and growing, should be thinned out to give room. The plants ought not to be left nearer than nine inches to a foot apart.

The usual care in gathering seeds of Peas and other vegetables, and hanging them up to dry, the taking up of Chalottes and Garlic, will be required towards the end of the month. When a piece of Cabbage plants is nearly finished, cut the rest, pull up all the stumps and plant them in any out of the way corner close together, to take up but littleroom, say three inches apart—they will afford a dish of tender greens by their sprouts when they are most acceptable and least expected.

Dig all vacant spaces, and if you do not fill them again with winter greens leave them in ridges.

SALADS if in request may be treated all times alike, be always sowing, planting out, (in the open air or under frames) and consuming, especially of Lettuce, some of the more hardy kinds of which may always be in season with management.

#### FRUIT GARDEN.

Those who propose to try autumnal grafting may go to work this month. The operation will be just the same as spring grafting, so far as the manipulation is concerned; but the great aim must be to have a neat, close fit of the scion to the stock.

Take the greatest care in keeping all troublesome vermin under. Snails, slugs, moths, ants, wasps, &c., are so many formidable marauders, and spoil ten times more than they devour, use all the means you know to extirpate them, and to divert the attention of the remainder from the part you wish to preserve. Bottles of sugar and beer hanging in the trees, rotten fruit and arsenic, in flat shallow vessels, at short distances, but out of the way of poultry, or other domestic animals, and away from bees; and all the contrivances for catching and killing should be put in requisition. Ants may be drawn together by rotten fruit on the ground, and occasional watering with a rose watering pot full of boiling water will settle their business. Snails must be industriously hunted; woodlice and earwigs may be taken in bean-stalks, inverted flower pots on short sticks, and with a bit of moss in the bottom, halves of turnips hollowed out, and hollow side downwards. Slugs may be taken with common cabbage

leaves on the ground, and examined morning, noon, and evening; but every means must be resorted to that can be thought of.

**FRUIT GATHERING** should always be done in dry weather, and with a basket so close to the work, that they can be laid, and not dropped, into it. However slight the fall of a Pear, premature decay at that part is inevitable; however hard they may be, they should not be dropped into any thing. For market, with an unripe thing, it is of small consequence, because it will not show any blemish, and may be two hundred miles before any mischief ensues, but for your own use, you must not suppose a fruit will bear knocking about when it is hard, and wants a month or two keeping. The damage is fatal to keeping-fruits; and hundreds of pears, gathered hard, commence rotting before ripening, from carelessness in the gathering. There is no Pear to which this carelessness is more fatal than the Charmontel, and the spot which begins to decay is as bitter as gall. So slight a bruise will affect them, that merely touching one another on the tree when the wind blows, renders standard fruit more liable to rot than wall-fruit, from that single fact. Dry weather is indispensable! no wiping of fruit can dry it equal to the sun and wind.

**KEEPING OF FRUIT** is one of those concerns which every body likes to manage his own way. Many keep them in boxes, baskets, and tubs, air-tight; this is one way. I have always kept them in an airy fruit room, not subject to the draught of air, but, singly, on wicker shelves, with a slight layer of straw under them, and another over them; I speak now of choice fruit not very plentiful. They require to be frequently examined, wiped, and turned, and the more carefully this is all done, the more completely will they keep in good order. I have by these means kept many fruits a considerable time longer than usual. Again, a most important point is the period at which to gather. I have always found it best to try a fine specimen from the tree, time after time, till the pips are turning yellow, on their road to brown; as soon after this as the weather will permit is desirable. If left long afterwards, they get too forward to keep, and if gathered before, they never come to their right flavour. This, of course, is applied to Apples and Pears; Plums, Peaches, Nectarines, &c., cannot hang too long on the tree, but should have nets placed to catch any that fall. The longer they hang on the tree the finer the flavour, without any exception; and though they are, for market, necessarily gathered before they are ripe, to carry better, they are not so fine in flavour, and they ripen faster than on the tree; or perhaps I ought to

say approach decomposition faster, for the effect is different to ripening. All fruits that vary in the time of ripening on the same tree, ought to be gone over several times, instead of cleared at once. Some will always be found to take the lead, and these gathered, the others immediately improve. This applies to many fruits; and those who clear a tree at one gathering, find that the rough crop will not bring them near so much as when they take it at three or four gatherings. I have seen a cherry tree picked over every other day, and the first pick not more than a pound or two, bringing half-a-crown a pound; the second perhaps eighteen pence, and a fair crop coming in at reduced prices; but the last and worst would be fine through the removal of the best.

**PRUNING STANDARDS.**—When the leaf has fallen, or is falling, you may begin pruning standard fruit trees; and if your orchard and garden is in the state which I find nine out of ten in, wherever I have been, you will have plenty of amusement to last you through the winter. Almost every tree is too thickly crowded with branches; they are not only in each other's way, and prevent you from getting among them to prune, but they keep the sun off half the crop, and prevent a free circulation of air. Look well to the position of the branches before you commence, and recollect that all those which cross good healthy branches, well disposed round the tree, must come out, and not those which are in their right places. Cut away all spindly upright shoots inside the head as it were; look well, also, to branches which dip too low, and inconvenience you for the under crop. Make all your cuts clean with a saw, and then go over the surface with your knife. In sawing off a branch begin by cutting underneath, and make an incision about one-fourth through, and rather rounding so as to compass as it were the under half, then when you saw downwards to get it off, there is no splitting or tearing the wood by the falling branch. In many cases you improve a tree by shortening a limb, at other times by only taking off lateral branches from it, and sometimes by removing the whole limb; but in all cases, by removing those useless upright shoots which are like so much brushwood choking up the interior of the head, excluding light, air, and sun;—but lessons on pruning might be found to last the winter through.

**STRAWBERRY RUNNERS** which have rooted may still be planted, but the sooner the better; when the best time has been allowed to go by, the penalty of neglect awaits us. The plants *may* do well, but if done at the beginning of August they *must* do well. Those who have not got the British Queen should get it, even thus late, if possible. Some may be planted

at the edge of a south border, a foot apart; others may be planted in rows on a high, dry, warm border, nine inches apart in the row, and the rows two feet apart; next year dig between them, and dress well before the runners go far, and peg down the strongest half-way between the rows to make new rows, picking off all the spare runners; the old plants may be taken up to make room for a repetition of this as soon as they have given two good crops.

#### FLOWER-GARDEN.

**AURICULAS.**—These must be constantly examined to see that their drainage is free, it often occurs that with all the care that can be taken to prevent it, the bottom hole gets stopped up with soil or worm casts, and unless frequently examined, the stoppage of the water will throw the plant into bad health, and defy its recovery for the season. The dead leaves should be removed frequently, and the plants should be taken to their winter quarters in the course of the month. Seedling Auriculas should be refreshed with water very carefully, and frequently, although they must not be kept wet. This is also a reasonable time to buy in plants of such varieties as are required, though many prefer leaving this till spring, and paying more for them, to having the trouble of keeping new sorts all the winter. The principal object in the winter quarters is to have the frame perfectly dry. They should be paved or boarded, or composed at the bottom, for the water which comes through the pots must run away, and not sink into the ground, the damp exhalations arising from a wet bed of ashes or sawdust, or any other material that breeds moisture, would often prove, and has often proved, fatal to collections. Some persons have their pits or frames deep and standing up near the glass, but if the water be allowed to soak into the bottom or lay therein, the damp is not the less fatal, nor the air less foul, on account of the plants being raised up high; as a general rule, the plants ought to be near the glass, but the bottom if not paved, should be made of gravel and lime laid down wet, and spread evenly, but upon a gentle slope to allow the wet to run clear away any time they are watered. This would be found more efficacious than any thing yet done to simplify the culture of the Auricula.

**CARNATIONS AND PICCOTEES.**—The layers which are struck should be potted in large sixty sized pots, one in a pot, or in forty-eight sized pots, a pair in a pot. They should have for a soil, to go through the winter in, a clean sandy loam without dung; they are not required to be excited, but to be kept in health, and grow but little through the winter

months. The top spit of a meadow where the loam is sandy is the best that can be used. They should be placed on slates or boards, or other medium that no worms can get into the pots; and I should be extravagant enough to have Hunt's patent pots for my best sorts, for the double purpose of keeping out the worms and giving air under the bottom of the pot; this however is a matter of choice, thousands have grown them in common pots, and so have I in full health through very bad seasons. Their winter quarters should be similar to those of the Auricula; they are even more liable than Auriculas to suffer from damp and want of air. Houses and pits of many different constructions have been made for wintering Carnations, and many papers written upon the subject; I find it necessary to give them plenty of air and keep them perfectly free from damp, they require no more than this, and it is quite a matter of indifference how this is done.

**DAHLIAS** are now in full flower; they require to be tied well to stakes as they grow, and any flower likely to be wanted for exhibition, should be made fast that the wind cannot move it, and the neighbouring shoots or leaves within such distance as to allow the wind to blow them to the flower, must also be made fast or cut off. The slightest bruising even by the agitation of leaves blown towards them, will destroy a bloom for show in a few minutes. Some fasten the blooms to a flat board by cutting in the board a slit to the middle to pass the stalk; this flat board is propped up with legs to form a table, and the bloom when fastened to the centre is covered with a glass or pot at the option of the grower, according to his notions of advancing or keeping them back; for further particulars however, I refer to the treatise, page 21, Vol. II. I prefer flowers grown in the open air for brilliance, keeping after being cut, and capacity to travel; but shading at a distance is desirable in burning weather, and when the wind is powerful, or the vermin plentiful; those who depend on exhibiting are obliged to cover them. Cuttings that have been struck should be continued growing to advance the tubers as much as possible before they are allowed to die down. Pods of very fine flowers intended for seed, should be marked, and the instant any flower is past its prime, or on other accounts useless, it should be cut off to prevent its distressing the plant by seeding.

**BULBS.**—Some of these intended to be forced early may be potted, Hyacinths and Narcissus, Crocus and Amaryllis, Tulips, with others usually appropriated to the earliest forcing, may be potted and buried in sand or sawdust. Those intended for glasses may be placed

in their water, and put in the dark. October and November are, however, the principal months for the general potting and glassing of bulbs. In the open ground this is a good month for removing the soft scaly kind of bulbs such as Lilies, Crown Imperials, &c., and they should be as short a time out of the ground as possible, as they are impoverished by drying.

**PERENNIALS** may be parted to increase them, especially when their patches are enlarged much, or it will answer well to cut away with the spade as much as will leave the remainder undisturbed of a proper size; all the species taken from Perennials may be planted out on nursery beds to grow, or at once into borders and places where they are to bloom. This, however, does not press so much, but it may be done any time before January with safety.

**GREENHOUSE, FRAME, AND OTHER TENDER PLANTS** which have been bedded out in the garden and are intended to be saved through the winter, must be potted up carefully and removed under cover. Geraniums, Verbenas, may be cut in both root and top to go into small pots for the sake of taking less room, when this is not an object, the straggling branches only need be cut in and the root may be all saved. Such plants as are required to spring again from their roots in the ground must be earthed up high enough to keep the frosts from their roots, or covered up with tan, or leaves, or litter.

**TENDER GREENHOUSE PLANTS** in pots must be housed somehow before the end of the month, some may be taken to the dwelling house, some in pits, some may be preserved by only digging holes and covering them with boards and litter during frost, but letting them have all the air in mild weather. From this time they must all have no more water than just enough to keep the mould in the pot from being dry. They must also have all the air that can be given in mild days and if occasionally placed out in the open air so much the better for them though more troublesome. If they are in greenhouses or pits they will require to be uncovered except in foggy, damp, and rainy weather, and covered at night, for there is no answering for frost towards the end of the month, especially if the moon be bright and near the full. The Dahlia growers almost dread a bright moonlight night after the 20th, for the first frost spoils all their hopes when their flowers are at their best: very slight protection will save a plant if it be but closed, and does not touch the branches. If, for instance, a waterproof muslin cover like an extinguisher, or like a meat cover, was placed even over a tender plant in the ground, and be closed down to the surface of the soil, that plant will be safe, as if in a greenhouse, through

a moderate frost, and frames so covered instead of with glass, will keep in the natural warmth of the soil much better than glass.

**SEEDS OF FLOWERING PLANTS** should be gathered in dry weather, and carefully dried to lay by until sowing time.

**PANSEYS** may be struck in time, to lay by in pots for the winter. Cuttings already struck may be planted out or potted off, as they may be required; if potted, they ought to be in large sixty-sized pots; If planted out, it ought to be in a dry situation, rather sheltered from the east and north winds, six inches apart, and after being once well watered should not be kept too moist.

**POLYANTHUSES**.—Seedlings may be transplanted in a moderately sheltered and dry border, six inches apart, and the whole watered to strike their roots.

**SEEDLINGS, WALL-FLOWERS, COLUMBINES, SWEET WILLIAMS, ROCKETS**, and other perennials and biennials, should be planted out from the seed bed, if not already done; the place should be very open; and after once well watering, they may take their chance.

**SLUGS** and **SNAILS**, ants and earwigs, grubs, moths, wire worms, and other pests, should be destroyed with great industry and care; but moths, especially, should be regarded as the parents of whole colonies of these caterpillars, depositing their eggs, just before they die, when the spring will hatch them, and thousands be distributed about the garden.

**CALCEOLARIAS** may be propagated from off-sets, which will be found for the most part rooted. These should be put in pots (small sixties), with compost of half loam, the other half leaf mould, rotten dung, and peat, in equal quantities; the bottom should be well drained, and the whole placed in a close frame for a few days. Any that have no roots must be covered with a hand glass until they have struck; and if placed where they can be assisted by a little bottom-heat, so much the better.

**CHINA**, and all the smooth-barked **ROSES**, may be cut in, and the cuttings placed thickly in a pot of sandy compost, never allowed to be thoroughly dry, but kept in the greenhouse in a cold frame, where, without any other care than the necessary moisture, they will strike root during the winter.

**ANNUALS** of every kind may be sown in moderately sheltered places to stand the winter, in the same way as if the seed were naturally shed in the ground; many kinds will come much stronger and earlier into flower by this autumnal sowing. *Mignonette*, *Nemophylla*, and many other annuals, will brave the winter better in the open ground than in pots covered over.

## ASHES OF VEGETABLES.

THE result after the burning of weeds, dry leaves, hedge-clippings, and, in fact, all kinds of vegetable rubbish which cannot be conveniently formed into compost is called wood ashes. Their constitution will, of course, vary with the nature of the substances from which they are derived, but, notwithstanding this, they possess many *constant* properties which render them of considerable importance to the agriculturist. When any vegetable substance is burned, the whole of the oxygen, hydrogen, and nitrogen which it contains is dissipated, together with a greater or less proportion of the carbon, according to its more or less complete exposure to the air during combustion. The existence of carbon in the ashes depends upon the fact, that plants require a considerably greater quantity of oxygen gas to convert *all* their carbon into carbonic acid, than they contain naturally; as, therefore, this extra quantity must be derived from the atmosphere, it is evident that the proportion left undissolved will depend inversely upon the quantity of the air brought in contact with the burning mass. Ashes are consequently composed of all the fixed saline ingredients of the plants from which they are derived, together with more or less carbon. In addition to which, when produced by burning heaps of vegetable rubbish, they frequently contain humic acid, derived from the *partial* decomposition of those portions of the heap which are least exposed to the flames. On account of their possessing the above constitution, it is evident that their utility as manure will depend upon the following circumstances:—1. Since they contain saline matter derived from plants, it is evident that they can in their turn supply other plants with these valuable ingredients; but since all vegetables do not possess precisely the same saline constituents, and as the ashes used for manure are seldom, if ever, derived from the same species as those to which they are applied, but on the contrary, from weeds, hedge-clipping, &c., it follows that they will not be capable of supplying those salts which are *specific* to the various cultivated crops. On the contrary, however, all those saline substances, which are common to most plants, and which constitute by far the greatest proportion of the whole earthy matter that they possess, are contained in, and hence can be supplied by, ashes from whatever vegetables they may have been derived; and, moreover, having been already absorbed by plants, it may be supposed that they will be in a sufficiently minute state of division to admit of their re-absorption. 2. Another circumstance which renders ashes peculiarly useful as manure is, that they always contain a

considerable quantity of *vegetable alkali* (*carbonate of potass*), derived from the decomposition of various combinations of potass with vegetable acids, which exist in nearly all plants. This alkali will serve a double purpose. It will, in the first place (when mixed with the soil), act upon, and combine with, a certain portion of insoluble organic matter, and thus render it capable of absorption; and, in the second place, when taken up by the roots of the plants in combination with organic matter, will be *retained* by them in order to form those various combinations with vegetable acids already alluded to, as existing in the majority, if not in all vegetables. As we have had occasion to refer to the use of both *mineral* and *vegetable alkali* (the *carbonates of soda* and *potass*) as manure, it will be interesting to point out an important difference which exists between the two in their mode of action, not so much from its being of any great practical importance, as from its pointing out some of those very intricate changes which are constantly occurring in nature, and a thorough knowledge of which may, as science advances, be of the utmost consequence in rendering certain those all-important circumstances which are at present involved in such great obscurity. If we examine carefully the constitution of the earthy particles of plants, we shall find that, whereas potass is of almost constant occurrence, soda, on the other hand, is but rarely met with, and, when it does exist, it is almost always in the form of muriate of soda (common salt). For this reason, therefore, carbonate of soda, which, as we have already seen, is denominated *mineral alkali*, on account of its occurring much more frequently and abundantly there than in the organic kingdom, whether vegetable or animal, can of itself be of no direct value to any plants, except to those few which contain common salt. Its sole action is, therefore, confined to the preparation of food *in the soil*. Potass, again, not only performs this office, but is itself so constant an ingredient of plants, that it supplies them, in addition to *organic food*, with a very valuable part of their *mineral* constituents. Were we to content ourselves with the above fact alone, we should, of course, conclude that carbonate of potass was a far more valuable substance to the farmer than the same salt of soda. Unfortunately, however, few of the operations of nature are so unconnected as to admit of so simple an explanation; for if we look more carefully into the subject, we shall find that, all things considered, carbonate of soda is in fact the most valuable to the agriculturist for the following reasons:—*First*. As soil always contains a considerable quantity of decaying vegetable matter, it must at the same time be always sup-

plied with potass in some form or other. *Secondly.* As by far the most important office (as regards extent at least) which is performed by either of these substances, is its chemical action upon the organic matter of the soil, it follows that the one which is most efficacious in this respect will be the most valuable as manure. The result of examination here is decidedly in favour of carbonate of soda; 1. Because it is more efficacious, in the proportion of 32 to 48, in dissolving organic matter: and 2. From the fact of soda being of little or no value to the plants themselves, all that is absorbed in combination with the food will be returned to the soil by the process of excretion, and will consequently be capable of performing again the same office, viz., rendering soluble the undecomposed portions of the organic contents of the surrounding soil.—*H. R. Madon, Edin.*

#### THE DIFFERENCE BETWEEN FLOWERS AND WEEDS.

NEARLY all the flowers of the garden are either odoriferous or remarkable for some beauty, and others are called weeds because they are troublesome or ugly; the beauty must consist of a large quantity of flower as compared with the foliage, or very brilliant colours; now the fact of being troublesome, excludes many pretty subjects from our collections; take the Bearbine for an instance. This has a very refreshing perfume equal to the Clematis or the Thorn, and is in form like the Convolvulus, but it entangles with everything near it. The roots are worse than Couch-grass to spread about, and when once in the ground it is a regular pest. Some are equally troublesome on account of the spreading of the seed, and the difficulty of clearing the ground; take the Poppy for example; the brilliance of the common Red Poppy would have secured it a place in any garden as a favourite, were it not that when once in a ground, the seeds are dispersed in myriads, and they seem to lay for years, those only which come near the surface appearing to vegetate, so that every time the earth is dug or ploughed, or stirred, a fresh crop of these unwelcome visitors come up all over the place as if they had been sown broadcast. Take another instance, the Charlock, the bright dwarf yellow flower with which some ill-managed farms are overrun; nobody will deny that the brightness of its colour, and the quantity of bloom would have placed it among garden favourites, but it will so take possession of a neglected place, that for many years it will come up in sufficient quantity to damage everything else, and take a long time

to eradicate. These are instances of handsome bright yellow and red flowers being considered weeds. It may, however, be told against the Poppy, that the bloom is very fragile, the petals flimsy, and the smell nauseous; but on the other hand they come out in rapid succession, and are very near the ground, so that this would never be alone sufficient to exclude them. The number of plants which are excluded from the insufficiency of flower is very great; and there is scarcely a flower to be seen in the hedge rows, or banks, or fields, which is handsome as a plant: they may be very beautiful to look at a single flower, but place one alone, and it will be found very meagre and poor. There are, however, many flowers so very bright and pretty in themselves, that notwithstanding the ugliness of their plant they seem to stand as it were on the boundary, they are even wild, but they are admitted to some gardens. The corn bottle is an instance. The bright blue flowers of this plant may be seen in many wheat fields, contrasting their brightness with ripening corn, and claiming a high station among the beauties of the wild and the waste, and pushing their claims to a place among those of the garden. We only mention these as instances, which, from being so familiar, illustrate our meaning. The fashion of the day admits and excludes various subjects for a time. Novelty will carry us very far, and a better plant in the same way will cause an old one to be neglected, if not thrown out altogether. Among the old annuals, the common yellow lupin, the common blue and the common red, have been all but excluded, and the chances are that half the seed-shops possess only the yellow. The *Lupinus Polyphillus*, *Cruikshankii*, and one or two others, but especially the varieties of the *Lupinus Polyphillus* are so infinitely superior as a plant, that we need not wonder at the old ones being discarded, except the yellow, which is tolerated for its colour alone, but which is little esteemed for the rapidity with which its seed vessels swell, and the flowers go off, for, before one half the flowers of the spike are opened, the lower ones have faded. There are other old annuals which are but little grown, but which used to be as regularly upon the list of all little gardeners, and some large ones, as mignonette and sweet peas—we mean *Venus' Looking-glass* and *Virginian Stock*, both very dwarf, and when in flower very showy. These have been excluded from choice gardens for the extreme shortness of their period of bloom; they are in flower hardly a fortnight, and people begin to appreciate the value of a long blooming period more than ever; in time, many things at present tolerated in gardens will be excluded to make way for better subjects.



The simple difference, then, between flowers and weeds simply arises from taste. One plant is as perfect in all its parts as another; and the common mode of expressing contempt for a thing is to call it a "mere weed." A plant is a weed in the owner's eyes when it will come and is not wanted; but, generally speaking, the taste of the public is settled by "likes and dislikes," founded on no principle, as they imagine, but easily accounted for by those who examine into causes and effects.

#### SALTPETRE AND NITRATE OF SODA.

Experiment.—By the Right Hon. the Earl of Zetland

IN May I sent a ton of the nitrate of soda from London to Upleatham, in the North Riding of Yorkshire. I directed that it should be tried on wheat, turnips and meadow-land, at the rate of  $1\frac{1}{2}$  cwt. per acre. I am now of opinion that it was too late for wheat; for, although it appeared to make the straw grow stronger, I do not believe there was any material increase in the quantity of grain over the adjoining land which was not manured. For turnips I consider it entirely failed, and was of no use whatever; but, on the meadow-land, its effects were astonishing. In the course of nine or ten days after the application it could be seen an inch where it had been sown; and, on mowing the field, 90 square yards were measured, and the grass carted off as soon as cut, and weighed; the weight was 30 stones, of 14 lbs. to the stone. The same quantity was then measured off that part of the field immediately adjoining, which had not been dressed with the nitrate of soda; that part was cut and weighed in the same manner, and the weight of it was only 14 stone. I must add that the land was of precisely the same quality in the same field, and the whole field had been equally well manured in the winter with good farm-yard manure.

I afterwards had it tried on several meadow-fields after the hay had been carried, and the effect was very soon visible by a great increase in the growth of the after-grass; and both cattle and sheep seem to eat it greedily.

Experimental Results.—By James Everitt, Esq.

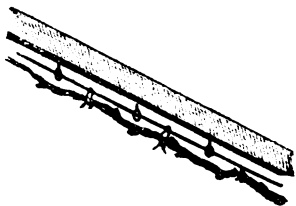
I will venture to predict that, upon all *light warm soils*, it will ultimately be found to be beneficial as well as profitable: on the contrary, I have reason to believe that, on *cold clay-land*, on an average of seasons, it will not more than repay the outlay. I will not detail the particulars and results of the two trials I have already given it; perhaps I ought to premise that much the greater part of my occupation

(1100 acres, the property of the Right Hon. Earl Spencer) is light land, with but a small portion of clay. In the first week in April, 1838, I sowed by hand part of a field of wheat, of good light land, at the rate of 1 cwt. per acre, of East India saltpetre (nitrate of potash), for which I paid 26s. 6d. per cwt. Its effect was very visible in the course of a week, and continued very superior to that part left unsown quite up to harvest. I then had two rigs (as we term them) reaped, and kept distinct, each containing rather above  $1\frac{1}{2}$  acre; the result, upon threshing, was, that I obtained an increase in favour of the saltpetre  $6\frac{1}{2}$  bushels per acre, besides a considerably greater weight of straw: as I did not weigh it, I cannot accurately state the extent, but I believe I am not overrating it at one-sixth. In the first week in May, 1830, I sowed part of a field of wheat (my strongest land), and at the same time part of another field of oats (light land), with 1 bushel (about  $\frac{3}{4}$  cwt.) per acre of American nitre (nitrate of soda), which cost me 23s. 6d. per cwt., or about 18s. per acre. I adopted the same precaution as I did the previous year; and the increase in favour of the nitre was, upon my wheat, not quite 4, and on my oats rather more than 15 bushels per acre; the difference in weight of straw (in this instance I weighed it) was 11 cwt. per acre. From these results, valuing the wheat at 8s., and the oats at 3s., per bushel, it is very evident that, in every instance, I have received a very ample return for my capital employed; the variance in the produce of the wheats I attribute to the nature of the soil, taken in conjunction with the cold wet summer we experienced in 1839: this, in a great measure, is the ground upon which I assume it is more calculated for light than strong soils. I have the opinion of a very eminent professor of chemistry, that he believes the American is better calculated for agricultural purposes than the East India nitre. Among florists there was a very general practice of putting nitre to the water, in which flowers were placed for show, but it requires great experience to apply it, or it is fatal.

#### VINES IN HOUSES.

THE simplest mode of providing for the training of a Vine up the rafters of a house, is to drive long shanked nails with eyes at the head every two or three feet, so that a wire can be strained through these eyes the whole length of the rafter, and if other plants are to be grown in the house, one branch along each rafter to bear fruit, and one growing for the following year's

bearing, are all that need or should be grown; indeed at the ordinary distance of rafters, it is advanced to the contrary, the extent of, and the injury sustained from these innumerable as much work as a Vine ought to do for many years. The following will illustrate what we mean as to the mode of fastening, for any other injures the rafter itself, whereas the wire being a fixture, the Vine branch needs only to be tied to the wire with goodtwisted bass matting, which will last the season, at the end of which the old branch is cut away, and the new one may be fastened.



#### INJURIOUS INSECTS.—NO. V.

The Dry-Scale (*Coccus conchiformis*.—Gmelin.)

THIS species commits great ravages upon vegetation. Numbers of it infest our fruit trees, and by sucking the sap, especially from the younger shoots, they retard their growth, impair the flavour and size of the fruit, and, indeed, diminish the natural extent of the crop. It not only infests plants out of doors, but even those that are kept under glass, and will sometimes completely destroy them when it abounds. It attacks almost every plant, but in some districts to a greater extent than in others. At Lee, in Kent, it abounds on the *currant-bushes*; and in March, 1837, the *pear-trees* and *apple-trees* were greatly infested by it at Springfield, Arbroath. A gardener at the latter place says, that the insects resided upon the bark, and sometimes, he believes, even upon the fruit of those trees. It had a most destructive effect upon the branches and trees where it took up its abode; the branches decaying, and soon becoming utterly useless. If a young tree was planted near another infested by them, emigration soon took place, and in a short time the young tree swarmed with them. They appeared most partial to the Ribstone pippin, and black Acchan pear; never touching plums, peaches, or nectarines. Mr. Loudon has had the leaves and branches of the *Manettia* infested by them. In the *Field Naturalist's Magazine*, vol. i., 87, is a figure representing a number of scale insects attached to the rind of an apple sent to the editor by Mr. Maund. It is somewhat difficult to get thoroughly rid of this pest, owing to the female and her eggs ad-

hering close to the bark. "I am not aware," says Mr. Ingpen, "of any method of getting rid of it in this state, short of scraping it off the branches. This mode, however, would be extremely tedious, and at the same time endanger the life of the tree. There are various remedies in use; such as washing trees with tobacco-water, soft-soap and water, and lime-water; all destructive of insect life. But, in a matter of this kind, economy is of importance. Vegetable solutions are not injurious to vegetation; but mineral washes are no doubt dangerous. Lime-water, however, is an exception, and combines three important qualities; it is cheap, perfectly harmless to vegetation, and at the same time destructive to insects. I should recommend two or three applications in the spring, at intervals of one or two weeks, of strong lime-water with a brush, and a dusting of quick-lime before the branches get dry; or soft-soap and water, using also the powdered lime. For plants in the green and hothouse, a solution of bitter aloes is said not only to destroy the insects, but to prevent their future appearance on the plant washed with it. I think the cause of failure in getting rid of this pest has arisen from the application of remedies at improper seasons, that is when the female has become fixed to the plants. I would suggest that the remedies be applied when the young larvæ make their appearance. In this state they are locomotive, and may be easily detected with a pocket-magnifier. If, therefore, at this period, any of the above remedies were applied two or three times in the above manner, I have little doubt of a successful result." —*Entomological Transactions*, i., p. 175.

The white scale and the mealy bug, two other species of *Coccus*, infest the pine-apple (*Ananassa*) to a serious extent. "The filthy unsightly appearance of plants swarming with these insects, even if they caused no injury whatever, would be a sufficient reason for their annihilation. That they do considerable mischief, is but too evident from the numerous wounds inflicted on the epidermis of the leaves. The veins, and the parenchyma immediately under, soon become affected; in a short time the injury extends entirely through the leaf. A heated atmosphere, such as is necessary for the pine plant, is peculiarly favourable for their reproduction; so that in a few months from their first appearance they will have reached over the whole pit, and every plant, nay, every leaf, will swarm with them. To those, therefore, who are acquainted with the economy of plants, these thousands and tens of thousands of insects, must have made an equal number of incisions, destroying in every instance the respiratory organs, and impeding the free circulation of the fluids. For whatever may be

punctures, will be too evident to the physiologist. Consequently, the cultivator's first object should be to cleanse his plants from these pests. The proper season to accomplish this, is at the time of disrooting the young plants; for it is only advisable to operate on those not intended to produce fruit the following season. The plan I pursued, and which proved most completely successful, was to take two pounds of sulphur, two of soft soap, one and a half of tobacco, two ounces of iux vomica, one ounce of camphor dissolved in a wine-glassful of spirit of turpentine, and boil the whole for an hour, in eight gallons of water. When the mixture has fallen to a temperature of 120 degrees, immerse each plant separately, keeping the liquid as near as possible to that degree of heat. The young stock subjected to this immersion will, for a considerable time, present a very dismal appearance; but they will soon grow out of it, with a few months good treatment. Great care must be taken not to bring the infested plants, or any part of them near those that are clean. All the old fruiting plants, as soon as the fruit is cut must be destroyed, and the crowns and suckers taken from them during the summer, must undergo a similar process before they are admitted into the pit. Some interruption will undoubtedly take place in the system of culture; but all those who pride themselves on clean plants must submit, and for the sacrifice thus made, the compensation will be ample." — (*Glendinning on the Pine Apple*.) Kettlewell, in his *Treatise on the Pine Apple*, gives the following receipt for getting rid of these insects:—"Take horse-dung from the stable, the fresher the better, sufficient to make a hotbed three feet high, to receive a melon-frame three feet deep at the back; put on the frame and lights immediately, and cover the whole with mats, to bring up the heat; when the bed is at the strongest heat, take some fagots, open them, and spread over the surface of the bed, so as to keep the plants from burning or scorching; then set the plants or suckers bottom uppermost on the sticks, shut down your lights quite close, and cover them well over with a double mat to keep in the steam. Let the plants remain in this state for one hour, then take them out and wash them in a tub of cold water, previously brought to the side of your bed; then set them in a dry place, with their tops downwards to drain, and afterwards plant them. By this method you will be sure to kill every insect, and if the suckers are kept in the frame all the winter, stuck in the tan, without soil or fire, the effluvia from the linings will also kill them." It is said that these insects may be destroyed by smearing the infested parts of the plant with a strong solution of clay of the consistency of thin paint,

and letting it remain on the trees till it is dry, and, in a few days afterwards, washing it off; it is, however, a good preventive.

#### EDGING FOR BORDERS.

AN American amateur has given us an interesting article on edgings for flower beds. After enumerating various plants for this purpose, and rejecting them along with the box, because the evergreen, as he alleges, soon takes up too much room, harbours slugs and other noxious vermin, exhausts the soil by its fibrous roots, and is apt to be winter-killed at the north, and summer-killed at the south. He proposes a new plan:—

"I planted in the same line, and so close as almost to touch each other, one bulb of each, repeatedly, three kinds of *Amaryllidea* of nearly the same habit, and which multiply by offsets so fast, that they can be easily obtained in sufficient quantity, viz. *Zephyranthes*\* *atamasco*, *Z. rosea*, and *Stenbergia*† *lutea*. Early the next spring, my row of *Atamasca* flowers, of the most brilliant white, changing to pink, was the admiration of every passer-by. They continued to push forth for several weeks, and for a considerable time after their leaves formed as fine a margin of green as one would wish to see. These leaves had scarcely begun to die away, when the flowers of *Z. rosea* began to appear, and kept flowering nearly all the summer. The leaves lasted till late in the fall, when the *Crocus*-like golden flowers of the *Sternbergia* took their place, and had a doubly cheerful effect from all the adjacent vegetation having fallen into the sere and yellow leaf." We can easily conceive the beauty of such edging; but find in this district insuperable obstacles at the outset. *Sternbergia lutea*, though hardy with us, and remarkable for the rich glossy green of its leaves, increases very slowly in the limestone soil of the Genesee country; and *Zephyranthes atamasco* fares still worse: we have not had it to bloom more than once before it has declined, and eventually perished. *Z. rosea* we have not tried, but it appears not to withstand the severest winters even in England. With all due deference, however, we must think that Box is the best plant for edging in this climate, whatever may be the case in Georgia. It is neither damaged by the cold of winter nor the heat of summer; and we know not that any noxious vermin have found a harbour amongst its leaves. Neither ought it to exhaust the soil by its fibrous roots; a spade passed down near it on the inside of the border, would limit their extent in that direction; but Box for edging should be kept in a

\* *Amaryllis lutea*.

† *Amaryllis atamasco*.

dwarf state, not exceeding three or four inches in height, and trimmed to a straight edge like the roof of a building. In this condition it is not found to be troublesome. We have nothing so permanent that is so easily increased—nothing that has leaves of so fine a green through all the vicissitudes of the year.—So much for our transatlantic friends' notions of edgings for borders.

## PUBLIC GARDENS.—NO. II.

### THE GARDEN OF SYDNEY, NEW SOUTH WALES.

THE beautiful climate and fertility of the soil of New South Wales, although a British colony, and three times the size of the mother country, is very little known in England, excepting to a few who may have made horticulture and botany their particular study. No country in the world is so rich, or can produce so spontaneously the gifts of Nature, as this happy land. Here the products of Europe, Asia, Africa, and America will either grow naturally in the open ground, or they may be reared with a very little trouble by the means of art. The colonist of New South Wales, generally speaking, is his own farmer and his own gardener; therefore the study of agriculture and horticulture becomes as natural to him as medicine does to the physician. By his industry, and that of his family and labourers, he reaps his own corn, fruit, and vegetables, and lives by the produce as an independent son of Nature. The science of agriculture and horticulture, within the last few years, has made very rapid progress in this colony through the encouragement given by the government authorities, and the support of the most influential denizens of Sydney, in forming an Agricultural and Horticultural Society, which may be justly considered one of the first in the world, the country itself being as one vast garden, or *prairie*, affording every opportunity for the advancement of one of the richest treasures of Nature. This society has correspondents throughout the whole colony and Van Dieman's Land, where a similar institution is being formed. The introduction of the vine from France and Spain, the mulberry-tree from China, the Jordan almond and date from Barbary, the olive and orange-tree from Portugal, and other rare fruit-trees from South America, are likely to prove of the highest importance to the colony, as they are found to grow with great success in different districts a short distance from the coast; and several very extensive plantations of the mulberry-tree for the breeding of the silkworm, vineyards, orange groves, and olive-trees, are now seen blooming with the same grandeur as

in their native soil, giving employment to hundreds. Wheat, oats, barley, rye, and Indian corn, plentifully store the fields, whilst potatoes and vegetables of every description, natural to this country and Europe, as well as the most delicious fruits, grow most abundantly in the gardens, each one having his plot of ground attached, or a short distance from his residence; so that the country has the appearance of an immense orchard, vegetable, and flower show, in which they try to outvie one another in its cultivation and produce. The fig-tree, of which there are many varieties, has been introduced from Provence in France, and from the environs of Malaga in Spain, and promises to become an important luxury to the inhabitants, as it grows spontaneously in the open air, rendering a plentiful crop. The choicest apple, pear, cherry, apricot, nectarine, peach, plum, and other trees of Europe grow to the greatest perfection with scarcely any trouble—the pineapple attains an immense size, weighing sometimes from fifteen to twenty pounds; and the different berries, viz., gooseberries, strawberries, raspberries, and currants, are far superior to any in the world. The great staple commodity of this colony, as an article of exportation to Europe, is wool; it, therefore, has caused a great emulation among the numerous and influential agriculturists to improve the breed of their extensive flocks, and prizes are awarded by the Agricultural Society for the best specimens of wool. During the last five years some valuable purchases have been made of the Merinos and Saxon breeds, for crossing with those of this country, and a most wonderful improvement has taken place in the fleeces, so that they can now boast of producing as fine and if not much better, quality than that of Spain, France, Germany, or England, and a far greater supply, as the vast plains afford excellent pasture to the large flocks that roam in the interior. The quantity of this article of commerce exported annually is immense; and, after the growth of corn, it is the most profitable commodity to the farmer and speculators, some of whom have introduced a few goats from Cashmere, in Persia, for the improvement of those that abound in the mountainous parts. The cultivation of the beet-root, for the purpose of making sugar, is now carried on on a very extensive scale by many of the agriculturists in their waste lands, and promises to become an article of great importance, as the high price of sugar from the West Indies, and the great difficulty at times of obtaining it, will render it an excellent speculation, as the soil is most productive, and the crops abundant. The great attraction at Sydney is the Botanical Garden, which, without exception, is the most extensive, and containing the choicest collec-

tions of fruits, flowers, shrubs, and botanical plants, in the world. The Garden of Plants, and the Luxembourg, at Paris; the Conservatories of Versailles, St. Cloud, and Fontainebleau; the Botanic Gardens of Montpellier, Marseilles, Haarlem, Amsterdam, Brussels, Vienna, Berlin, Dresden, and Madrid; the Garden of the Royal Society of Horticulture, the Horticultural Society of London, and the Physic Garden at Chelsea, contain very selected collections of every description of plants; but that of Sydney must wear the laurel. This grand Colonial institution has greatly improved under the scientific and experienced direction of Mr. Richard Cunningham (formerly of the Royal Gardens of Kew), chief botanist of New South Wales, Mr. Fraser, and Mr. McLean, who have made some most valuable additions of the rarest horticulturist productions from South America, New Zealand, China, as well as from Europe. The greatest care is taken by those entrusted with the different departments or branches of the science in preserving the fruits, flowers, and plants, in the best order; and one great advantage to the public is, that every species is marked with a label, so that every one is able to value the various productions. The tasty style in which the grounds are laid out, with long gravel walks with borders of aromatics, and fountains throwing up their crystal waters, giving a pleasant coolness to the air, renders it a terrestrial paradise. The various varieties of fruits, flowers, and plants, are arranged in the most diversified manner, each separately from one another, forming a most delightful *coup d'œil*. To give a detailed description of every plant would be too voluminous a subject; suffice it to say, that it possesses the most selected collections of hardy exotic, as well as every indigenous species of New Holland, Cape, New Zealand, South America, and European plants, which are most scientifically arranged according to their growth. The object of great attraction is the extensive vineries, which are of the rarest species. For this addition the colony is indebted to the exertions of Mr. James Busby, a gentleman of high horticultural attainments, who in 1831, during a tour through Spain, and the vine districts of the south of France, made a collection of the most celebrated varieties of the vines of Xerxes, Malaga, Rousillon, Languedoc, Burgundy and Champagne, cuttings of which he obtained from the growers themselves on the spot, or from the Botanic Garden of Montpellier, and the splendid collection of the Royal Nursery of the Luxembourg, at Paris, which contains 570 varieties; upwards of 400 shoots of those that were forwarded to the Botanic Garden are now in the most thriving state, and furnished several

thousand cuttings, that have been transplanted with the greatest success in different parts of the colony and Van Dieman's Land. There are upwards of twenty varieties of the grapes of Spain, the Pedro Ximenes, the small white Muscatel, the Mantua Castilian, Nua del Rey, (white) Mollar black, the large white Muscatel, Machard Nudo, Marbelli, Jaen, Doradillo, Cabriel, Temprana, Layren, &c.; these have succeeded beyond expectation; besides the above, there is a fine collection of the Hamburgh and Rhenish grapes, many of which were received through the kindness of Mr. Allan Cunningham, from the splendid collection in the gardens of his Grace the Duke of Northumberland, at Sion House. These are planted with much science, some in pots or square wood cases, in trellis, or in the open ground, according to their natural growth. The grapes are of the finest flavour. The orangery is on a large scale, containing a fine collection of trees from Portugal, Spain, and Italy, of citron and limes, which grow with great vigour. The pinery is a very select one, some of the plants have produced apples weighing from twenty to thirty pounds of exquisite flavour. The fruit trees are not only numerous, but of the rarest varieties. Of apples, pears, peaches, nectarines, apricots, plum, cherries, walnuts, chesnuts, hazelnuts, the Jordan almond, Valencia, and other sorts; the date of Tunis, a large variety of figs, and a fine selection of the different species of the mulberry-tree from China and other parts, for the propagation of the silk-worm; and the most exquisite trees of the country, South America, and Europe. The strawberry and raspberry beds are of the finest growth, as well as the gooseberry and currant bushes. The varieties of melons are very extensive, and this cooling and wholesome fruit grows spontaneously, the same as in Spain and Portugal, with scarcely any trouble. The olive also grows to great perfection in different districts. The *Potogeril*, or kitchen garden, contains a most extensive collection of every description of vegetables indigenous to this country and other parts of the globe, which grows to the greatest perfection, yielding two, and in some instances three, crops a year. The grounds are laid out in the most picturesque manner, with regard to the different periodical productions, with very extensive and spacious conservatories for orchidaceæ, greenhouse plants, stove plants, cacti, and mesembryanthemums. The collection of flowers and shrubs is the most splendid that can be imagined, comprising the finest plants of moss roses, and every variety; ranunculuses white, white and green, white and striped with carnation, pure carnation or rose colour, striped carnation, &c.

Tulips of the purest and most variegated hues and rarest species; carnations, pinks, piccotees, geraniums, anemones, crocus, July flowers, jonquils, daffodils, double red and striped stocks, wallflowers, pansies, balsams, lilies, sunflowers, heartsease, myrtles, dahlias of the most pure and delightful colours; rhododendrons, cacti, laurel, *Laurus Alexandrina*, *Tinus*, *Sidum pyramidale*; in fact, the rarest and most variegated flowers and shrubs from every part of the globe adorn this beautiful garden. Among the exotics must be noticed the cotton plant, the tobacco plant, the different varieties from the Havanna, Virginia, &c., which grows here to perfection; the tea-tree, coffee, and sugar-cane; bread-tree, fly-tree, the *Galactedendron*, or milk-tree, cocoa-tree, *Ceratonía siliqua*, the caoutchouc or India-rubber-tree, the *Palma Christi*, and other rare trees from South America and the Pacific Islands, too numerous to enumerate, but the greater part of which thrive well in New South Wales. The botanical department contains every description of medicinal plants that are known as the produce of this country, South America, and Europe, which are attended to with the greatest care and science. There have lately been many rare additions of plants made to the Gardens from the splendid Botanic Gardens of Calcutta, and also seeds from different parts. There are annual shows held on a most magnificent scale in the gardens, of the first specimens of every production, and the public are allowed to make what purchases they may require of trees, plants, &c. for their own gardens, at a very moderate price. It is this facility that has given so great an emulation to horticultural and floricultural pursuits among the colonists, so that every town or settlement, both in New South Wales and Van Dieman's Land, have now their annual horticultural shows, at which prizes are awarded.

#### A FEW WORDS ON FLOWER SHOWS.

ONE effect of the increase of shows is the diminution of interest at all of them; and as a lesser number, or their total extinction, must be the result, it becomes us to consider which is the better of the two courses. Emulation is the life and soul of improvement: without competition there would be but little emulation; and the more general this competition is among individuals the better; but competition between societies is mischievous, or otherwise, according to their constitution. If they are independent of support, they can hardly be too numerous; but if at all dependent upon the public, they only injure each other. Thus, if a country town can cherish well a horticultu-

ral society, it will flourish, until a second is attempted; if a second is attempted, it can only be supported by persons who abandon the original, or who have sufficient means and motive to support both; and these, however they may flatter themselves, cannot do so much for each other as they could for only one. Thus the establishment of a second inevitably injures the first; neither succeed as well as they ought—and, indeed, would *alone*—and the result is unfavourable, until one of the two ceases to exist. Now, there is but one fact that will justify the formation of a rival;—it is the manifest unfairness, or inconsistency, or incompetency of what is already established. It has, in most cases, occurred, that the instant a second society was established, the first began to put its “house in order.” Faults which, till there was a rival, might have been preached against and complained of without effect for ever, are at once got rid of; systems that would have been proceeded with to the detriment of everybody, are instantly altered or improved by the establishment of a rival; so that one can hardly blame any spirited person for forming a second society, where there has been manifest injustice or acknowledged abuses existing in one already formed. Much, therefore, as we may be inclined to censure those who merely try to divide the supporters of well founded societies, we cannot, with any degree of justice, condemn others, who, seeing that there is unfairness in establishments already formed venture to exhibit a contrast in the rules, conduct, and general management of a second. Now, this appears to be the case in the establishment of the society which is to produce the grand show of dahlias. The faults of present societies are pointed out by the plan to be adopted in the new one. What is the inference to be drawn from the fact of giving ten prizes in one class? Simply a flat and practical demonstration, that two or three are too few. One can imagine all the rest. We can suppose that the plan which gives two or three of the same people the prizes year after year, and which deters others from showing, is condemned as unfair to the showers, and injurious to the science, because we see the new one provides some more prizes to encourage those who cannot always compete with the lions of the class. What is the inference to be drawn from throwing it open to the whole world? Why, that the plan of confining the prizes to numbers is cowardly, and, moreover, unjust to the public. What merit is there in half a dozen bungling growers shutting out all who can beat them? These things require no explanation. The managers do not accuse others of doing wrong, but they themselves do right, and leave us all to condemn the old and imperfect sys-

tem. There is a lesson to all horticultural societies in the proceedings of the managers of the Grand Dahlia Show, and we are not a little gratified that these proceedings are consistent with the plans recommended months since in *The Gardener and Practical Florist*.

#### THE OLIVE TREE AND THE PALM.

THE Olive tree abounds in the land of Canaan, it is also a native of the north of Africa, and the south of Europe; it is cultivated in France, Spain, and Italy, for the sake of its fruit, and the oil expressed from it; it thrives to perfection in the southern parts of France, particularly in Provence, the oil of which country is by some preferred to that of Spain or Italy.

The leaves of the Olive tree resemble those of the willow; and its fruit, which has a stone in it, is about the size of a small nutmeg. The olives, whilst upon the tree, are exceedingly bitter; but this bitterness is corrected by the method of curing such as are preserved for eating; those intended for this use are gathered long before they are fit to yield their oil, and laid to steep for some days in fresh water, after which they are put into a ley made of ashes and lime, and then removed into a liquor of salt and water, with which they are put up into little barrels, to be sent abroad; to give them a fine flavour, they throw over them an essence, composed of cloves, cinnamon, coriander, fennel, and other aromatics; this is a secret among those who deal in olives, in which, indeed, lies all the difficulty of the preparation.

The trunk of the cultivated Olive is knotty; its bark is smooth, and of an ash colour, and the wood is solid and yellowish. In the month of July it puts forth white flowers, growing in bunches, each of one piece, indenting towards the top, and dividing into four parts; after this flower succeeds the fruit (which we have before described), and which is principally valued for the oil produced by expression. For this purpose, they are gathered when fully ripe, and immediately bruised, and subjected to the press; the finest oil flows first, and a very bad oil is obtained by boiling what remains after expression, in water. Good olive oil should have a pale yellow colour, rather inclining to green, of a bland taste, without smell, and should congeal at 38 degrees Fahrenheit. In this country it is frequently rancid, and sometimes adulterated.

As the laurel branch is the symbol of glory, so the olive branch, covered with leaves, has, from the most ancient times, been the emblem of concord, the symbol of friendship and peace.

When Noah wished to ascertain if the waters of the deluge had abated, he sent forth the dove, who returned with an olive leaf in her mouth

—a very beautiful and expressive emblem of returning peace to the remnant of mankind.

It was the custom of the Jews to anoint with oil persons appointed to high offices, as the priests and kings, vide Psalm cxxxiii. 2; also I. Samuel, x. 1, and xvi. 13. The anointing with this liquor seems also to have been reckoned necessary on festival dresses, as in Ruth, iii. 3.

Washing the feet and anointing the head with oil, were the first civilities that were paid among the Jews on entering a friend's house; after the slaves had performed the first office, the heads of the guests were anointed with oil, and their hair drenched in aromatic unguent.

Olive oil rubbed upon a wound occasioned by the bite of a viper, and also taken internally, is a certain remedy; on which account the viper-catchers have always a bottle of this oil with them in case of need.

In Scripture we only read of two kinds of olives, the wild olive, and the cultivated olive; and the olive yards so frequently alluded to seem to show that almost every wealthy inhabitant encouraged the produce of the olive nearly as much as that of the grape.

The Palm-tree is found in a variety of the warm countries in the south of Asia, and the north of Africa; they were numerous on the banks of Jordan, but the best were those around Jericho and En-gedi, which latter place is for that reason called Hazazon-tamor, the cutting of the Palm-trees. This tree grows very tall and upright, and its leaves retain their greenness throughout the whole year; the more it is exposed to the sun the better its growth.

Palm-trees produce but little fruit, till about thirty years old; after which, while their juice continues, the older they become the more fruitful they are, and will bear three or four hundred pounds of dates every year. The date is a most sweet, luscious kind of fruit, on which most of the inhabitants of Persia, Arabia, and Egypt, entirely subsist.

A species of rich honey or syrup, and a spirituous fermented liquor called aráky, are obtained from it; there is also extracted from the Palm-tree a kind of wine, which is perhaps what the Scripture calls *shichar*, or strong drink.

As the sap is chiefly in the top of the tree, when they intend to extract a liquor from it, they cut off the top, where there is always a tuft of spring leaves about four feet long, and scoop the trunk into the shape of a bason; here the sap ascending lodges itself at the rate of three or four English pints a day, for the first week or fortnight; after which it gradually decreases, and in six weeks or two months the whole juice will be extracted.

As Palm trees were accounted symbols of victory, branches of palm were carried before conquerors in their triumphs; and in allusion hereto, the saints are said to have palm in their hands, to denote the victory over sin, Satan, the world, the persecutions of Antichrist, &c.—Rev. vii. 9.

A remarkable experiment to prove the fructification of this tree, occurs in the 47th volume of the "Philosophical Transactions." There was a great Palm-tree in the garden of the Royal Academy at Berlin, which flowered and bore fruit for thirty years, but the fruit never ripened, and when planted it did not vegetate. This tree Linnæus discovered to be a female plant, and as there was no male palm in its vicinity, the flowers never came to maturity.

At Leipsic, twenty German miles from Berlin, was a male plant of this kind, from which, in April, 1749, a branch of flowers was procured, and shaken so that the dust, or farina, fell upon the flowers of the unfruitful tree. This experiment was so successful, that the Palm-tree produced more than a hundred perfectly ripe fruit, from which they had eleven young palms. On repeating the experiment next year, the Palm-tree produced above two thousand ripe fruit. This experiment fully established the fact attested by the ancients concerning the Palm-tree, which some have regarded as fabulous.

This tree exhibits great variety in fruit, size, quality, and colour; twenty different kinds have been enumerated. Perhaps no tree whatever is used for so many and such valuable purposes as the Palm or Date-tree; even the stones are given to camels and sheep as food. These particulars are chiefly gleaned from *Bible Botany*.

#### VEGETABLE PHENOMENON.

At Mr. W. Grimstone's, of the Herbarry, Highgate, is now to be seen a pea plant in full bearing, which is remarkably illustrative of the great length of time the germinating property can continue in seeds. This plant was produced from one of three peas presented to the above gentleman by Mr. J. T. Pettigrew, surgeon, of Saville-row, having been taken by the latter and the authorities at the British Museum, from one of the vases recently extracted from an Egyptian sarcophagus, and where, according to computation, the vases with their contents must have remained for no less a period than 2,844 years. The vases contained a large quantity of dust, supposed to be the decomposition of a number of grains of wheat, vetch, and peas. Some of the grains of wheat have been sown and found productive, but the

vetch peas have not germinated; the other pea, resembling the British culinary pea, has in the above instance been tried effectually. The three peas were placed by Mr. Grimstone's gardener in a hotbed, and watched with great care. After some time, one only was found to sprout; it gradually increased in height, growing like a sprout, and finally burst forth a beautiful white bloom, with green stripes, having only four petals (an English pea having five); at the end of each are three singular fangs. Each flower was of a bell-shape, something like a convolvulus, but not so large, from the centre of which the pods have shot forth, and are now nineteen in number, and fit to gather, and they are in shape something between our marrowfat and cimiter peas. They have, of course, not been tried, but it is believed they are suitable for culinary purposes, judging from the blossoms having been white. Mr. Pettigrew, and several eminent botanists, scientific and other gentlemen, have seen this vegetable phenomenon, and take great interest in it. The great peculiarity of this pea is, that the blossom is not at the end of the seed vessel, but remains at the stem, the pea pushing out of the centre of the flower. It is thought by many to be altogether unknown. Mr. Grimstone's is the only pea that vegetated of all that have been distributed.

#### SPADE AND PLOUGH CULTURE OF POTATOES COMPARED.

It is, I know, customary, upon a large scale, to plough the land and make it tolerably fine before Potatoes are planted; but if it is ploughed five, six, or seven inches deep, and made fine and mellow, still at the bottom of such ploughing the land is hard and smooth, even in light lands, but how much more so where your subsoil is clay; and as the Potato is a root that sends out fibres not only near the surface, but deeply, if possible, it can never produce such a crop as where the land is broken eighteen inches to two feet; quite different from the bean and wheat, which thrive best with a firm subsoil. The Potato, like the cucumber, only enjoys itself in deeply pulverised soils, which causes them to flourish so much in well-managed sandy land.

I should therefore recommend, that in all lands where Potatoes are to be grown, if the land be either springy or otherwise damp, that it be drained deep enough to take off all springs or surface water. When this is done, the land should either be fully trenched or bastard trenched by the spade or plough, but I prefer the spade. By fully trenching I mean, to break the land up two spit deep, and by bastard I mean, only to shovel off the top weeds or rub-



bish, and dig one spit, and lay upon it when shovelled into the trench. When this is done by the spade, I should advise that the dung should in both cases be laid under the last spit which you throw up; this will prevent any further trouble, as you can then draw your drills (with a plough made for that purpose) not more than four inches deep; people can drop in the sets, and harrow, or if otherwise, you can draw in a few bushes to keep the tine from touching the Potato, so as to remove it. The width of the drills from each other must depend entirely upon the goodness of your soil: the richer the land, the wider apart must be your rows, and sets in your rows,—say, in ordinary land, rows at two feet from each other, and twelve inches from set to set may do; but if your land be very rich, three feet from row to row, and eighteen inches from plant to plant, will not be too much. This to some who are fond of close planting may seem a great waste of land, but in reality it is not so. I have heard people say, “such land is too good for Potatoes—there will be nothing but haulm;” but although a large grower in good and bad land, I confess I never found any too good, nor yet too bad, if properly managed, to grow good Potatoes.

The error is, in planting good land, you put in twice as much seed as is required; the consequence is, a great mass of haulm is produced, which being so close together draw each other up; your land is covered by a mass of green, which excludes the sun and air, and in dry summers sucks up all the moisture, and if any bulbs are formed, there is no moisture to bring them to perfection, and this is the true cause why in good rich land you do not obtain a crop; the fault, therefore, is not in the land, but in the management of such land; the very same error is committed in sowing wheat and other grain too thick.

Men, in clay or loam bottom, will trench land two spit deep for eight-pence, and lay in dung for one penny per rod, equal to nine-pence or six-pence per acre; and bastard-trenching, which will do quite well in most land, may be done as above for sixpence per rod, or four-pence per acre, which is much better than even three ploughings, as the spade or spud leaves the land rough at the bottom of the trench, whereas, the plough naturally leaves it smooth and hard. But if the land is to be prepared by the plough, it ought to be trench-ploughed—that is, the plough must go twice in the same place or furrow, so as to break up the land, if possible, from sixteen to eighteen inches deep at least. Then, if your land requires manures, you must plough that in, which will be three ploughings, which cannot cost less in stony land than £2 5s., and, unless your land

is properly pulverised, it will require another ploughing; so that you will find, when you come to look at both expenses, a few extra bushels of potatoes will pay all the extra expense of spade culture, which is sure to produce them; however, in each case pay the same attention to distance in planting, and be sure not to plant small potatoes, but sets cut from large ones, as you will find small Potatoes send up a good deal of haulm, and the bulbs in general are numerous and small too; whereas, a set good, with one or two eyes, will send up one or more stalks, and the bulbs in general are large also.

Having given you the methods most likely to produce large crops, having tried experiments for twenty years, I will now tell you what I have seen grow upon very poor land, when properly trenched and manured with farm-yard dung; it produced 700 bushels to the English acre of 160 rods, which was more than enough to pay all expenses and value of land, besides leaving it in good order for wheat to follow. B.

#### GARDENING FOR LADIES.

If we were about to teach our wives, daughters, and sisters, the whole practice of gardening, it is a hundred to one but we should forget in some of our directions, that we were advising the softer sex, and give them some awkward tasks. Mrs. Loudon could be trusted better, perhaps, for directing some of the most difficult of the operations for ladies. It is by no means certain, that the whole of the operations in gardening are adapted for females, but the great majority of operations are by no means incompatible with the neatness, delicacy, and proverbial ingenuity of the softer sex. Take budding, grafting, training, layering, propagating from cuttings, and pruning, all of which require no more exertion than a lady could use without the least impropriety or inconvenience; but when we go to the operations of digging, trenching, preparing dung, and making hot beds, the thoughts of seeing a lady at such work makes our pen refuse its office. Nevertheless, as our lessons on all the former more ingenious points of gardening are calculated for ladies as well as gentlemen, and therefore may be referred to at all times, with regard to some of the rougher operations, we will quote “Mrs. Loudon’s Gardening for Ladies,” especially the forming a hot bed.

MANURING THE SOIL AND MAKING HOT-BEDS.—Most persons imagine that manure is all that is wanted to make a garden fruitful; and thus, if the fruit-trees do not bear, and the flowers and vegetables do not thrive, manure is considered the universal pa-

nacea. Now, the fact is, that so far from this being the case, most small gardens have been manured a great deal too much; and in many, the surface soil, instead of consisting of rich friable mould, only presents a soft black shining substance, which is the humic acid from the manure saturated with stagnant water. No appearance is more common in the gardens of street houses than this, from these gardens being originally ill drained, and yet continually watered; and from their possessors loading them with manure, in the hope of rendering them fertile. As it is known to chemists that it is only the humic acid, and carbonic acid gas, contained in manure, which make that substance nourishing to plants; and as these acids must be dissolved in water before the roots can take them up, it may seem strange that any solution of them in water, however strong it may be, should be injurious to vegetation. The fact is, however, that it is the great quantity of food contained in the water that renders it unwholesome. When the roots of a plant, and their little sponge-like terminations, are examined in a powerful microscope, it will be clearly seen that no thick substance can pass through them. Thus, water loaded with gross coarse matter, as it is when saturated with humic acid, must be more than the poor spongioles can swallow; and yet, as they are truly sponge-like, their nature prompts them, whenever they find moisture, to attempt to take it up, without having the power of discriminating between what is good for them, and what will be injurious. The spongioles thus imbibe the saturated liquid; and, loaded with this improper food, the fibrous roots, like an over-gorged snake, become distended, the fine epidermis that covers them is torn asunder, their power of capillary attraction is gone, and they can neither force the food they have taken up into the main roots, nor reject the excrementitious matter sent down to them from the leaves, after the elaboration of the sap. In this state of things, from the usual circulation of the fluids being impeded, it is not surprising that the plant should droop, that its leaves should turn yellow, that its flowers should not expand, that its fruit should shrivel and drop off prematurely, and that in the end it should die; as, in fact, it may be said to expire of apoplexy, brought on by indigestion. All soil, to be in a fit state for growing plants, should be sufficiently loose and dry to allow of water passing through it intermixed with air; as water, when in this state is never more than slightly impregnated with the nutritious juices of the manure through which it has passed. The spongioles are thus not supplied with more food at a time than they can properly take up and digest, and a healthy circu-

lation of the fluids is kept up through the whole plant. But what, it may be asked, is to be done with a garden, the soil of which has become black and slimy like half-rotten peat? The quickest remedy is covering it with lime, as that combines readily with the humic acid, and reduces it to a state of comparative dryness; or, if the subsoil be good, the ground may be trenched, and the surface-soil buried two spits deep; in either case, it will be necessary thoroughly to drain the garden to prevent a recurrence of the evil. *All the different kinds of soil found on level ground, consist of two parts, which are called the surface-soil and the subsoil; and as the subsoil always consists of one of the three primitive earths, so do these earths always enter, more or less, into the composition of every kind of surface-soil. The primitive earths are—silex, (which includes sand and gravel,) clay, and lime, which includes also chalk; and most subsoils consist of a solid bed or rock of one or other of these materials, probably in nearly the same state as it was left by the deluge. The surface-soils, on the contrary, are of comparatively recent date; and they have been slowly formed by the gradual crumbling of the subsoil, and its intermixture with decayed animal and vegetable matter; and with other soils which may have been accidentally washed down upon, or purposely brought to it. In fields and uncultivated places, the surface-soil is almost as hard, and as coarse in its texture, as the subsoil on which it rests; but in gardens which have been long in cultivation, the surface-soil becomes so thoroughly pulverized by frequent diggings, and so mixed with the manure and decayed vegetables which have been added to it from time to time, that it is changed into the soft, light, fine, powdery substance called garden-mould. If the subsoil be naturally porous or well drained, this mould, however rich it may be made by the addition of decayed vegetable matter or animal manure, will always continue friable; and as long as it does so, it will be fit for the growth of plants; but if no vent be allowed for the escape of the water, and it be continually enriched with manure, it will be changed in time into the black slimy substance that has been already described. Surface-soil is called peat earth when it is composed of decayed vegetable matter, without any mixture of animal manure; and, as this excess of vegetable matter could neither be produced nor decayed, without abundance of stagnant moisture, this kind of earth is almost always found on a clayey subsoil, which prevents the water which falls upon it from escaping. Peat-earth has a spongy, elastic feeling when trodden upon, arising from the quantity of water that it holds, and it can only be rendered fit for cul-*

tivation by draining. In its elastic state it is what is called in Scotland a moss, and in England a peat-bog. Should the water, instead of being afforded a vent by drainage, be suffered to accumulate for many years, till it completely saturates the peat, the soil becomes what is called a morass or quagmire; and it can no longer be trodden on, as it will engulf any substance resting upon it. A still further accumulation of water will, in the course of years, cause the bog to burst its bounds, and overflow the surrounding country; as the Solway-moss did many years ago, and as bogs in Ireland have done frequently. An excess of vegetable matter on a silicious subsoil, differs from the common black-peat in retaining less water; and in being mixed with a portion of the primitive earth, which, from its loose texture, becomes easily detached from the subsoil. Peat in this state is called heath mould. The most productive soils are those in which several ingredients are combined in proper proportions; and if any one of the primitive earths preponderates, the soil becomes comparatively unfertile. Thus the best soil for gardening purposes is generally allowed to be a calcareous loam on a chalky subsoil; and this sort of soil is composed of nearly equal parts of lime, sand, and clay, enriched depositions of decayed animal and vegetable matter. The next best soil is a sandy loam, composed of clay and sand, enriched by decayed animal and vegetable substances, and resting on a sandy or gravelly subsoil. The worst soils are peat and sand. A poor sandy soil is necessarily a nearly barren one; because it will not retain either water, or the nutritious juices from manure, long enough to afford nourishment to the plants grown upon it; and it is obvious that a soil of this kind can only be rendered fertile by mixing it with clay; which would change it into a sandy loam. A stiff clay is unfertile from its attracting moisture and retaining it round the roots of the plants till they become swollen and unhealthy. It also retards the decompositions of manure, and obstructs the progress of the roots, which waste their strength in the efforts they make to penetrate, or twine round, its adhesive clods. Soils of this description are improved by a mixture of sand, gravel, road grit, or any substance which tends to separate the particles of the clay, and to render it light and friable.—Chalky soils succeed better unmix'd, than any of the other kinds; but chalk being a carbonate of lime, can hardly be called a primitive soil. The chalk, however, from its whiteness, is colder than any other soil; as it does not absorb, but reflects back the rays of the sun. Rain also penetrates into it very slowly, and not to any great depth. Chalk mixed with

sand forms a kind of calcareous loam admirably adapted for growing vegetables; and chalky soils are peculiarly susceptible of improvement from manure. *Manures.*—The kinds of manure generally used in gardens are horse or cow dung, and decayed vegetable matters; the manure in both cases being suffered to lie in a heap to rot before it is spread on the ground, in order that its component parts may be decomposed by fermentation, and thus brought into a fit state to afford food to the plants. Old hot-beds or mushroom beds are thus well adapted for manuring a garden; and when fresh stable-dung is employed for that purpose, it is generally thrown into a heap, and turned over several times till the fermentation has abated, before it is dug into the ground. As, however, a great quantity of carbonic acid gas is evolved, and escapes during the process of fermentation, and as it seems a great pity that so much of the nutritious properties of the manure should be lost, it is now customary to cover the dunghill with earth, into which the gases will rise during the process of fermentation, and in which they will deposit the greater part of their nutritious properties. A quantity of earth should also be laid round the dunghill, to imbibe the liquid that runs from it; and this earth, part of which must be removed and fresh added every time the dunghill is turned over, will be found very nearly as valuable for manuring the beds of a garden, as the manure itself.—*The modes of applying manure differ according to the difference of the soils.* For sandy loams, thoroughly rotten dung, either from an old hot-bed, or from a dunghill sufficiently decayed to be cut easily with the spade, or the earth that has covered a dunghill, during the process of fermentation, should be laid on the surface of the soil, and dug in. In very poor sandy soils, rotten manure, or earth from a dunghill, should be laid on the surface of the soil, and not dug in: being covered, if hot dry weather be expected, with leaves, straw, or the branches of trees cut off in pruning; or occasionally sprinkled with water. Soils of this description, and loose sands, are frequently improved in the south of France and Italy, by sowing them with seeds of the common white lupine, and then, when the plants have come up and grown about a foot high, ploughing or digging them into the soil. The green succulent stems of the lupines, when thus buried in the soil, supply it with moisture during the process of their decay; and thus nourishment is afforded to the corn, which is immediately afterwards sown upon the soil for a crop. Clayey soils should have unfermented manure mixed with undecayed straw laid in the bottom of the furrows made in digging; that the process of

fermentation, and the remains of the straw may operate in keeping the particles of the soil open, or, in other words, in preventing their too close adhesion. Lime (though when burnt it becomes violently caustic, and will destroy and waste all the manure applied with it), as carbonate of lime, or chalk (in which state only it can properly be called a soil), retains the manure applied to it longer than any other soil. Rotten manure may thus be dug into chalk, with the certainty that it will be preserved from farther decay for a very long time, and that every shower will work a small portion of its fertilizing juices out of it, and carry them into the soil, where they will be thus presented to the plants in the best possible state for affording wholesome food. Peat soils may be improved by the addition of quick lime as a manure, which will absorb the superabundant moisture which they contain; or they may be mixed with sand, gravel, or clay, to give them firmness and tenacity, and then with a small quantity of animal manure. Sandy peat or heath mould is very useful in gardens for growing heaths, rhododendrons, kalmias, or any plants with fine hair-like roots; and from the quantity of vegetable matter that it contains naturally, it does not require any manure, more than what is furnished by the decaying leaves of the plants grown in it. Nearly the same rules apply to decaying leaves and other substances used as manure, as to stable-dung. They may be buried in an undecayed state in clayey soil, when it is the object to separate the adhesive particles of the clay by the process of fermentation; but their component parts should be separated by fermentation before they are applied as a manure to growing plants. Vegetable mould (that is, leaves thoroughly decayed and mixed with a little rich loam) is admirably adapted for manuring the finer kinds of flowers, and plants in pots. There are many other kinds of manure used in gardens occasionally, such as the dung of pigs, rabbits, and poultry, grass mown from lawns, parings of leather, horn shavings, bones, the sweepings of streets, the emptying of privies, cess-pools, and sewers, the clipping of hedges and pruning of trees, weeds, the refuse of vegetables, pea haulm, &c. All these should be fermented, and applied in the same manner as the common kinds of manure. The following is a summary of the general rules to be observed in manuring and improving soils:—Never to use animal manure and quick-lime together, as the one will destroy the other. To use lime as a manure only in very sandy or peaty soils, or in soils abounding with sulphate of iron. To remember that rotten manure is considered to give solidity; and that

unfermented manure, buried in trenching, has a tendency to lighten the soil. To dilute liquid manure from a dunghill with water, before applying it to growing plants; as otherwise, from the quantity of ammonia that it contains it will be apt to burn them. To cover and surround dunghills with earth during the process of fermentation, to absorb the nutritious gases that would otherwise escape. To remember that the manure of cows and all animals that chew the cud, is cold and suited to a light soil; and that the manure of horses, pigs, and poultry is hot, and suited to a firm soil; also that all manure, when well rotted, becomes cold in its nature, and should be treated accordingly. To remember that all mixed soils are more fertile than soils consisting only of one of three primitive earths, viz. lime, sand, or clay; and never to forget that too much manure is quite as injurious to plants as too little. *Formations of hotbeds.* Though nearly all the kinds of manure which have been enumerated may be used occasionally for hotbeds, the only materials in common use in gardens, are stable manure, dead leaves, and tan. The first of these, which is by far the most general, consists partly of horse-dung, and partly of what gardeners call long litter, that is, straw moistened and discoloured but not decayed. The manure is generally in this state when it is purchased, or taken from the stable, for the purpose of making a hotbed. The necessary quantity of manure is procured at the rate of one cart load, or from twelve to fifteen large wheelbarrowfuls to every light, as the gardeners call the sashes of the frames, each light being about three feet wide; and this manure is laid in a heap to ferment. The heap should then be covered with earth to receive the gases evolved during fermentation, and earth laid round it to absorb the liquid manure that may drain from it. In about a week the earth may be removed, and the manure turned over with a dung-fork, and well shaken together; this operation being repeated two or three or more times, at intervals of two or three days, till the whole mass is become of one colour, and the straws are sufficiently decomposed to be torn to pieces with the fork. The size of the hotbed must depend principally on the size of the frame which is to cover it; observing that the bed must be from six inches to a foot wider than the frame every way. The manure must then be spread in layers, each layer being beaten down with the back of the fork, till the bed is about three feet and a half high. The surface of the ground on which the hotbed is built, is generally raised about six inches above the general surface of the garden; and it is advisable to lay some earth round the bottom of the bed, nearly a

foot wide, that it may receive the juices of the manure that will drain from the bed. As soon as the bed is made, the frame is put on and the sashes kept quite close, till a steam appears upon the glass, when the bed is considered in a fit state to be covered three or four inches deep with mould; observing, if the bed has settled unequally, to level the surface of the manure before covering it with earth. The seeds to be raised may either be sown in this earth, or in pots to be plunged in it. *The proper average heat* for a hotbed intended to raise flower seeds, or to grow cucumbers, is 60 deg.; but melons require a heat of 65 deg. to grow in, and 75 deg. to ripen their fruit. This heat should be taken in a morning, and does not include that of the sun in the middle of the day. When the heat of the bed becomes so great as to be in danger of injuring the plants, the obvious remedy is to give air by raising the glasses; and if this be not sufficient, the general heat of the bed must be lowered by making excavations in the dung from the sides, so as to reach nearly to the middle of the bed, and filling up these excavations with cold dung which has already undergone fermentation, or with leaves, turf, or any other similar material which will receive heat, but not increase it. When the heat of the bed falls down to 48 deg. or lower, it should be raised, by applying on the outside fresh coatings of dung, grass, or leaves, which are called linings. When hotbeds are made of spent tanner's bark or decayed leaves, a kind of box or pit must be formed of bricks or boards, or even of layers of turf, or clay, and the tan or leaves filled in so as to make a bed. Where neatness is an object, this kind of bed is preferable to any other; but a common hotbed of stable manure may be made to look neat by thatching the outside with straw, or covering it with bass mats, pegged down to keep them close to the bed."—Mrs. Loudon's directions for this masculine operation of forcing a hotbed, are, as will be noticed, communicated in a clever and ingenious way, though we should have been more apt to have directed our fair friends to employ a gardener for all the rough business, and to undertake only the ladies' or lighter portion themselves. Mrs. Loudon is nevertheless right in teaching ladies how a thing is to be done, because, they must be the better able to direct a man who does not know the business, or to see they are not imposed on by those who do.

#### ASSUMED "TAINT" IN THE POTATO.

IN the December number of the *Quarterly Journal of Agriculture*, there is an elaborate paper by Mr. Aitken, of Castledouglas, which professes to explain the taint in the Potato,

and to prescribe an effectual remedy. The taint is considered by the author as an effect of debility. The Potato is, he thinks, in its greatest vigour when produced not from tubers, or the cuttings of tubers, but directly from seed. In proportion as successions are distant from the seed he supposes the root to be more debilitated—more near that period which is assigned to the existence of all animal as well as vegetable life. In the *Quarterly Journal* for March, this theory is questioned by a gentleman of great experience in the cultivation of Potatoes—Mr. Towers. He asks how it happened, if it be true that though the root has been cultivated in these countries for nearly three centuries, and though the succession of some sorts have been multiplied to an extent surpassing the reach of memory, the "taint" is the effect of some cause of which there is no trace in any but very recent years. "One of two things," he says, "must be admitted—1st, either the Potatoes had not fallen into that state of age, decrepitude, or aridity, which precedes decay, during the long period that had intervened between their first introduction and the year 1831; or 2nd, age has nothing whatever to do with the taint." There is, however, one conclusion at which Mr. Aitken has arrived, which this writer believes to be well-founded, and which is certainly very important—namely, that the seed is best which is green—that is, which has been dug out before it has been allowed to ripen, or become overgrown. Both authorities also agree in the following opinions:—First, Potatoes grown in an elevated, cold, and wet situation—such as on a high mountain—are least of all liable to fail. Second, The seed should be put in as fresh as possible. —There is always danger to be apprehended from sets that have become dry and flaccid before they are put into the ground. Mr. Towers uses two precautions, and he never has lost a crop: one is, he takes care that the soil is duly prepared, and the other, that the sets are put down "within the hour of their being cut." "Entire tubers provide against contingencies and secure a crop," but to use them is wasteful, and the produce does not compensate in proportion for the vast expenditure of seed. Third, It saves the tuber to pluck off the blossoms as soon as they make their appearance. The late Mr. Knight (a high authority on the subject) was of opinion that this practice is capable of increasing the produce one ton an acre. Fourth, Over-growth deteriorates the quality of the root, and a preventative is found in cutting down the stems while still green. Large tubers are generally considered best, but small sized ones are preferable, being less likely to have the disadvantage of over-growth. Fifth, Over-manuring in a rich soil is a bad

practice. "Sets which would fail in rank land frequently produce fine foliage and healthy tubers in a light sandy loam. The following is from the paper of Mr. Aitken:—"There is, perhaps, no operation in the culture of the Potato that requires nicer care than the procuring of green tubers in a warm season; but it is quite practicable, and, as it is a new operation, it will require both practice and careful observation to do it perfectly. When performed by art, it can be done at the precise time required, which is not always the case when nature operates. I would prefer the cutting down of the stems, allowing the tubers to mature in the drills, until the ordinary season of taking up the crop, because the drills are the natural bed of the tubers, and the longer they remain in them the better, and the green stems may be turned to profitable account by feeding sheep. Sheep might be enclosed upon the field as upon turnips, the ground thereby enriched by them, and the following crop greatly improved. The sheep would not use the stems entirely, but they would crop the green tops and leaves as effectually as to stop the growth of the plant. It should be understood that I am suggesting this new plan of using the stems of Potatoes, as I have never seen it practised, though I think it worthy the attention of agriculturists, and I hope they may try it. Mr. Towers explains the meaning of tuber to be a knob, swelling, or excrescence. In other words, it is the root taken out of the earth—the vegetable, as we see it dug out for use at the table. We shall conclude the present notice of this most valuable portion of our agricultural productions, by mentioning as a fact that has fallen within our own experience, that the soil in a moist state is favourable for the introduction of the seed, and that the sets being limed before planted are placed in a condition to attract moisture, and derive from that circumstance no inconsiderable chance of thriving well and rapidly.

#### MR. DUNCAN ON VINES AND VINE BORDERS.

IN the first place, the whole extent of ground in front of the Vinery, intended for the border, is removed to three and a half feet deep, and sloping towards the south at an angle of five degrees, in order to carry off superfluous moisture from the border soil above, and to admit the genial influence of the sun's rays, both of which considerations are important in early forcing.

At the bottom of the excavation, and immediately under each Vine, a drain is formed crossing the ground its whole width; these drains are of loose stone work, eighteen inches wide and deep inside, and covered with flag stones.

At the middle of the border, or fifteen feet

from the house, another drain is formed, crossing these at right angles, and is much larger in its dimensions, being four feet wide and two deep, with open drainage two feet clear. At the extremity of the border, passing in the same direction, is another drain, similar to the one just described—these drains are intended to draw off superabundant water from the small drains which lead into them, in excessive rains, or from other causes. The spaces between the drains are filled with lime rubbish, brickbats, &c.

Secondly.—The border overlying this is composed of the following materials, namely, that portion which extends to seven feet from the house, and when the Vines are planted, is a light turfy loam, with a little admixture of coopers' ashes, lime rubble, and sea sand, and a layer of three or four inches of rotten dung at the bottom. Beyond this, and to the middle crossing drain, a stronger and richer compost is used, half being the soil suitable for the growth of melons, and the remainder rotten dung, lime, &c., the same as before, to which I have added since, a considerable quantity of bones and bone dust. These matters are well mixed together, and, if possible, should have been exposed a couple of years before using.

It is proper to say here, that the depth of the border soil over the drains is only two feet—the reason for which will be assigned hereafter. The part of the border beyond the middle drain is intended at a subsequent period to be continued in the same manner; but at present it is merely filled with the original soil.

In the third or fourth year, or soon after the Vines become considerably laden with fruit, the remainder part of the border is completed. The richest materials are used, containing a portion of sugar-bakers' scum, and fellmongers' refuse, both of which are replete with animal matter. Here, also, are buried carcasses, bones, and blood, inducing the extension of the roots, and supplying the finest aliment required for sustaining the vigour of the Vines.

The following observations will explain my views for adopting the plan herein described:

In using the lighter kind of soil, in the earlier age of the plant, during the first two or three years, it is intended to induce only a gradual and moderate degree of vigour, to insure successively a round, short-jointed, and well-ripened system of wood, in contradistinction to an excessive state of luxuriance, constantly following the indiscriminate use of richer composts, and which is inconsistent with the known principles of vegetable physiology. Future excellence, and a well-sustained and progressive development are often sacrificed to a desire for premature fruitfulness, and exces-

sive luxuriance, imagining that one is invariably the result of the other. Age, as well as dimensions at the part immediately above the soil, should be assumed as the rule determining the period and extent of bearing.

The arrangement of the next portion of border is founded upon the same principles, the more extended and maturer state of the plant, requiring a richer and more abundant supply of nourishment, and so on, to its completion.

The shallowness of the border is intended to produce a correspondence between branch and root; the branches taking a lateral direction seem to indicate the necessity for a similar disposition of the roots, analagous to the obvious arrangements of other trees.

The great admixture of lime rubble and sand ameliorates, by its chemical action, the condition of the soil, and affords freedom to the roots better to absorb the juices necessary for the subsistence of the process, and induces that tendency to dryness so suitable to the natural disposition of the Vine. The obvious arrangement of the drainage, and its extent, are intended to provide a perfect passage for the percolation and escape of superfluous water.

The slope of the border being considerable, presents a better aspect for the admission of the sun's rays, which is of importance in raising the temperature of the soil, especially at the period of forcing, and in exciting those chemical changes among its particles which produce the necessary elements becoming the food of the plant. The finest grapes invariably obtaining where such a disposition occurs naturally or made so artificially.

With regard to walks crossing a Vine border, none should be allowed on any account; but, for convenience, one of trellis-work may be formed, as we have; it is essential to encourage surface roots, knowing that they imbibe the healthiest aliment in that situation, in consequence of their proximity to light, rain, and other atmospheric influences, important to vegetable development, which would be prevented by the gravel walk.

As to the finest kinds of new grapes, I can say but little: the very best black grape that I have yet seen is, "Mouly's St. Peter's," weighing four to five pounds. One exhibited at the Durdham Down Nursery weighed four pounds two ounces, it is exactly similar to the old St. Peter's, but a capital improvement on it. We have a splendid Frontignan here, and in the neighbourhood, but I am unacquainted with its name; it is in all respects superior to the rest of the Frontignans, and one of the finest in cultivation; Cannon Hall, and Wilmott's Muscat are excellent. Knight's new Vine for culture in pots is unequalled, and an excellent grape for other purposes.

#### NORTHERN FLORISTS' TREATMENT OF THE POLYANTHUS.

No flower can more justly lay claim to the title of being beautiful than the Polyanthus. Its varied tints, the richness of its colouring, the grace and elegance of its form, agreeable fragrance, easy propagation, hardy nature, and being one of Flora's earliest visitors, it is welcomed with no ordinary feelings of satisfaction by every one who possesses the least taste for flowers. To the industry and zealous attention of the northern florists we are much indebted for the rapid and progressive improvement it has made during the last few years.

It is supposed to owe its origin from both the Primrose and the Oxlip.

The Polyanthus is grown to the greatest perfection in an airy situation, yet sheltered from the rays of the sun, as its excessive heat has a tendency to impair its strength. In the spring, it is necessary to examine the plants and pots minutely early in the morning, as well as in the evening, to destroy all slugs and snails which may be found upon them, as they are very great enemies to this plant. The Polyanthus has also another formidable enemy, though small—this is the *acarus*, or red spider. When the plants are infected with this destructive insect, the leaves become yellow and spotted. The best remedy is, to remove the infected plant immediately from your collection, and place it in a more distant situation, and soak it in a strong infusion of tobacco-water. A sprinkling of quick lime upon the plants has been found beneficial and effectual.

The young florist is recommended to select his plants in bloom.

The Polyanthus grows best in a light sandy soil, and some florists add peat when a yellow sandy soil cannot be got. The following compost will grow them well:—

- |    |                         |                                 |
|----|-------------------------|---------------------------------|
| 1  | peck light yellow loam, |                                 |
| 1  | " sand,                 |                                 |
| 1½ | " cow dung,             | } to be at least two years old. |
| 1½ | " horse ditto,          |                                 |
| 1½ | " leaf mould.           |                                 |

The properties of a fine Polyanthus are as follows:—

The stem ought to be strong, elastic, and erect, of such a height that the truss may be above the grass or leaves of the plant. The foot-stalks should be stiff, and of a proportionable length to the size and quantity of the pips, and not less than five or more in number, that the truss may be close and complete. The pipe, tube, or neck of the petal, should rise above the impalement, be short, and finish fluted in the eye; the antheræ should cover the neck of the tube: this is what the florists call a *thrum eye*. When the style perforates

and shows its stigma above the antheræ, this is called a *pin eye*, from its resembling a pin-head; such a flower is rejected by all modern florists, let its other properties be what they may.

The tube should be round, of a bright yellow colour, well filled with anthers, bold and distinct. The eye should be round, of a bright clear yellow, and distinct from the ground or body colour.

The ground or body colour should be a dark rich crimson, resembling velvet, quite free from speck or blemish of any kind. The pips should be large, and of rich and lively colours, and nearly all of one size, and lie *quite flat* and smooth, as free as possible from ridges or fluting, and as round as they well can be to preserve their peculiarly beautiful figure, which is circular, excepting those small indentions between each division of the limb, which divides it into five or six heart-shaped segments.

The edging should resemble a bright gold lace, *exactly the same colour as the eye*, and go perfectly round each petal, also down the centre of each division of the limb to the eye, and the lacing or edging to be all of one breadth.

The best period for potting plants is after blooming, which will be in June, when especial care should be taken to make a good drainage. The plants must be dressed, and all offsets, or heads, which have roots, should be detached. After potting, water well, that the soil may be the better settled to the roots; and place them in a shady yet airy situation, and water them only when it is actually necessary, else there is a probability of their perishing by the rot. They will require protection during the winter months. A frame is the best, taking care to let them have the benefit of all fine weather. In March, you may let them have the benefit of all gentle showers of rain that may fall. Top dress them with a strong compost. The compost generally used is cow-dung and horse-dung, very old, and a very small quantity of coarse sand. If you intend to exhibit, you must thin out all superfluous buds; those in the centre are the best to be taken away.

New varieties are raised from seed; and if you wish to be successful, take seed only from those varieties which possess good properties. When the seed-vessels begin to open, the seed is nearly ripe, and every day you must gather such heads as are brown, or else you will in all probability lose the best of your seed. The seed should be spread upon paper, and perfectly dried before it is laid by, and kept in that state until the last week in January or first week in February, when it must be sown in small pots, and the seeds be covered with soil about the thickness of a shilling, then be covered close with a glass. The plants will make their appearance in about six weeks. When

they are large enough, transplant them into other pots, about one inch apart, and in June or July transplant into other pots. When they require watering, do it with a brush, by rubbing your hand over it, so that it may fall upon the soil like a heavy dew.

This paper by Mr. Slater of Manchester, leaves us with small seedlings. It is necessary to say that if you have a clean bed of good loam, they will do better planted out than by any other mode of treatment.

#### CULTURE OF THE WHITE CARROT.

WHENEVER a new vegetable is introduced, although I would by no means put aside the varieties in common use to which it most nearly approximates, yet I would recommend, that the novelty should have a fair trial against those of long known and established repute; and then, even if it is not found in itself to be superior, before it is utterly discarded, I would ascertain if it possesses properties that, either by culture or by hybridizing, would increase its own merits or those of its nearest allies. By this means we may hope that one out of many novelties will prove of superior value to those already in cultivation; and that progressive improvement will be realised, either in increased production on a given space, or in better flavour, or more nutritive qualities, in the subject of our experiments. About seven or eight years ago I received from the Horticultural Society, and also from France, a few seeds of the White Carrot, which I sowed in the nursery in company with the sorts that are usually grown, and found the new comer increase in size more rapidly than the orange, or even the Altringham varieties. At that time, believing them adapted only for kitchen use, we repeatedly tasted them during their growth, and also when they had acquired maturity: my friends' and my own opinion coincided; we mutually pronounced them, neither in flavour nor appearance, at all equal to the common kinds. The greater weight that the white variety acquired, under precisely similar circumstances, was an object too important to be passed over, and accordingly several of our agriculturists were induced to grow patches of the White Carrot in their fields as food for horses; and in the neighbourhood of Ashford, in this county, many acres have been grown during the past year, and, as far as weight is concerned, with entire success. The land best adapted for its culture appears to be of a sandy character, and even in some instances a considerable growth has been obtained upon almost a pure sand. This, then, constitutes its chief value; it may be profitably cultivated upon lands that are at present utterly worth-



less. In our county there are hundreds of acres between Deal and the Sand Hills, now waste, that might be made to produce this vegetable; and in Suffolk, near Brandon, where many acres of a similar character exist, and that hitherto have never yielded employment to the labourer, nor profit to the landlord, its growth might be encouraged so as amply to repay the outlay. On some of the worst soils that it has been tried upon in this neighbourhood, about a ton per acre has been produced; and upon others of a sandy nature, where cultivation had been farther advanced, eighteen, and even twenty tons have been obtained upon the same space. This variety has the power of collecting nourishment where the sorts previously grown would be incapable of procuring it; or as the growers express it, would be burnt up. We must not, with this advantage, however, overlook its defects. It will be readily inferred from what has preceded, that although a greater quantity of vegetable matter is produced on a given space, yet its relative quality as food is not equal to that of other kinds; its weight and bulk being made up by a larger quantity of watery particles. This circumstance accounts for the fact, that the roots, when stored up, are more liable to decay than those of the ordinary kinds. It may be interesting to some to know the mode of culture adopted in this neighbourhood, although it differs little from

that pursued in the other varieties; and, as the season is fast approaching for sowing, I am not without hopes that it may be more extensively proved than it hitherto has been. The best time for sowing appears to be the last week of April, and the two first in May; for not only is it difficult to make the seed vegetate if sown earlier, but, of those that do succeed, many of the strong plants will put up flowering stems, and thus, reduce the value and weight of the crop. I may here caution growers against saving seeds from those plants that start prematurely, for by this practice, in a few generations, the stock would return to its wild condition, an annual; and thus, by losing its increase of succulency acquired by culture, lose all its value as an article of food. The land should be worked till it becomes very finely broken; and the drills into which the seeds are to be placed should be very shallow. The distance from row to row must be regulated by the soil and its condition; but the space of from ten inches to fourteen inches asunder, according to the circumstances named, will be found the most proper; for it will allow ample space for the plants to grow, and gives facility to hoe and thin out the superabundant ones; which latter operation should be commenced early, or the vigour of the seedling plants will be greatly diminished.



ROSA HARDII.

THIS beautiful variety has great claims on the lovers of the garden from its brilliant yellow colour. It is, as will be seen by the engraving, a single Rose, but it is very superior to some others of the yellow varieties: it is a free bloomer, and should be among the first, that any one who intends to raise seedlings should possess, and it makes a noble and brilliant show

among standards, in which form it is to our fancy much more effective than in any other. The best mode of producing this is to procure a strong briar for a stock, and for this reason; unless the stock is very strong it will not carry sufficient head to be effective, and even if it would, a large head on a pimpling little stem would be very ugly and unnatural. Having

procured the stocks intended for the operation as thick and straight as possible, plant them in good strong soil, that is, strong in its nature, a rich loam and leaf mould half and half, will be the best mixture, if you have to form the soil, but a good rich kitchen garden soil will do; or if the rose is intended for a lawn that has been long in use, the digging of a place in any part of it may be found sufficient, as most of the soil where grass has been growing for years is in fine order when dug. Let the stocks be planted in the autumn or winter, or early in spring, where the trees when they grow are to remain, if it can be so managed, whether this be in equal distances in a border, or single specimens on the lawn. Here the briars will the first season throw out buds nearly all the way from the bottom to the top, but all those below the top half dozen, should be rubbed off as fast as they come out. It may happen that the top bud will not be close to the top, as the stocks occasionally die down some distance, but must be cut down to the top bud. If the few buds that are within six or eight inches of the top one are allowed to grow, and all others carefully rubbed off as soon as they show, the top ones will be very much stronger. About the end of June the shoots will be strong enough to bud; select the strongest three, or even four, if they point different ways. The common practice of the nurserymen is to take only the strongest one, but they want every bud to make a tree; the budding operation is so well described in our treatise on the Rose, that it is needless to repeat it here, but insert a bud of the present subject in each of the strong branches, close as may be to the bottom, where they come out from the main branches, and shorten them a little, that the winds may not disturb them so much. The first season each of these buds will grow if they are properly done, and form a branch upwards of the rose inserted; as these grow there must be a stick tied to the trunk, to stand above it a foot or two, and let there be a bass tie so placed to the new wood and this stick, as to protect them in their position against the wind, which would blow them out of their places. At the season of pruning, in the early spring, cut each of these down to three or four eyes: and as these grow, rub off those which point inwards, and it will encourage those which grow outwards, and which will form the head. These branches must be treated the second year very carefully; instead of pruning the shoots down to the two lower eyes, they must be merely shortened to strong wood, and lateral shoots upon them must be removed, where they are too thick, but not altogether. The third year handsomely formed heads may be made before the growth is over, and their

superfluous wood alone must be cut out. The standards thus formed will be truly ornamental; and it should always be remembered that the standard, as now grown too generally, is an ugly unnatural object; and that the head, instead of being kept small, should be carefully trained into a handsome bold figure, and not like a long-handled mop, which nine-tenths of the growers think sufficient. When you have the head of the form you wish it to be, shorten the year's growth only, sufficient to keep everything clear, and the branches out of each other's way. The less cutting the more bloom; and no rose will prove more graceful than the one in question.

#### FRUITS OF CUBA.

*Lucuma mammosa*.—One of the order of the Sapotaceæ, and formerly an Achras. It goes by several names, among which are Sapote, Mammee Sapote, Mamey Colorado, Bully-berry. The tree resembles others of the same order. The fruit is of a conical form, covered with a rough, thick, brown skin or rind; looking like the entire meat of a cocoa-nut, deprived of its husk and shell. The pulp is of a very dark orange or flame colour, granular, rather soft, but not juicy, tasting like a pretty good common musk-melon. In the midst of the pulp is a long boat-shaped seed or stone, sharply pointed at both ends, of a mahogany colour and high polish, except where this colour and polish is interrupted by the rough scar, which occupies about a third of the surface, from end to end. The whole size of the fruit is from three to six inches in length, and from two to three in thickness. Sometimes there are two seeds in one fruit, always polished and beautiful, and of large size. There is, I believe, a variety of the Sapote, which is oval, and not conical. But I describe the fruit as I saw it in the market of St. Jago, where it is quite common.

*Mammea Americana*.—This fruit, as its name imports, is a native American. It is commonly called the Mamey of St. Domingo. The French also call it l'Abrirot de St. Domingue; and by the English it is often termed the Mamey Sapote. If the unlearned Europeans who go abroad and settle in foreign countries, had not by nature a beautiful way of confounding natural objects together, they would never have thought of bestowing the same name on this fruit which they give to fruits of the Sapotaceous family, which but distantly resemble it. The Mamey is classed with the Garciniaceæ. Among the umbrageous fruit trees, the Mamey takes the first place. It is a grand leafy pyramid, attaining the height of sixty or seventy feet, and presenting an aspect at the same time regular and luxuriant. The leaves are quite

large, nearly a foot in length, of a long oval shape, dark green, leathery, polished, and shining. The trunk is stout, and gives excellent timber. No one can behold this tree, towering in the fruit garden, without a sentiment of respect. Large and high-flavoured the fruit certainly is, but much too solid in its texture, one would think, to be proper food for "airy phantoms." It is noble in size, as large as a shaddock, or as one's head, globular, with a protuberance or mamelon at the end opposite the stalk, and covered with a russet skin. The pulp is of a close and firm consistency, like that of our quince or clingstone peach, and of a yellow colour. The flavour, also, resembles that of the peach, though it is more aromatic. It is eaten in its fresh state, but more commonly as a jam or marmalade, in which form it is one of the most exquisite of preserves. In the centre of the fruit is a stone or seed, of size corresponding to the fruit, brown, and very shaggy. Within the rough shell is a large meat, of the peculiar bitter taste of the peach-stone meat, but more delicate, which is much used for the flavouring of noyau, and other cordials. Sometimes there are two of these stones, and sometimes three.

*Magnifera Indica*, or *domestica*.—The celebrated Mango is now quite common in Cuba, though it was introduced from the East Indies not many years ago. Hughes, in his "History of Barbadoes," speaks of a young tree which had just come into bearing, as of a great novelty in that island, and gives a plate of it, which is barely tolerable. The climate and soil of the country have agreed with the trees so well, that in some places they have multiplied spontaneously into groves and even forests, and they bear in the greatest profusion. The tree is one of the most beautiful of fruit trees. The leaves are long, lanceolate, polished, hanging in dense masses of dark green foliage—so dark, that the orange trees look quite light by their side. The trunk is sturdy, and the branches spread equally, giving a full, regular, rounded form to the whole tree, which is about the size of a healthy and well grown apple tree. The blossoms are small, whitish, or with a red tinge, growing in upright spikes. When the fruit is formed, the spikes are reversed by its weight, and the mangoes appear among the leaves in long pendent bunches. While the fruit is young its colour is a fresh and lively green, which is a treat to one's eyes. When it ripens it generally turns yellow, and looks like a first-rate egg-plum, only twice as large. Some of the varieties are yellow, with a red blush on one side, and some hardly part with their green. The flesh is of a bright yellow, and quite juicy. The juice is thick, creamy, and luscious, and, together with a rich sweetness, possesses a pe-

culiar aromatic flavour, resembling that of turpentine, which in some species is so strong as to be disagreeable to the uninitiated. This thick juice composes nearly the whole of the fruit, which may be sucked away into the mouth, so that nothing but the stone and a mass of fibres will be left. The stone is long, compressed, boat-shaped, without polish, irregularly grooved, and covered with hairs or fibres, which penetrate the fruit, and cause it to adhere closely. There are a vast many varieties of this fruit in the East Indies, and there are several in Cuba. The French names of some of them are, *Mango filandreux*, *M. savonneux*, *M. abricot*, *M. cœur*. Of these the *Mango cœur*, or Heart Mango, is much the best, and is also one of the largest. It is more delicate, and has less of the turpentine flavour than the others. It derives its name from its shape. Though the mango tree is so ornamental, and its fruit is so fine, it is thought by some planters to be for their interest not to suffer it to grow on their estates. The trees, they say, shade their coffee, and the fruit is prejudicial to the health of their negroes, who are very fond of it, and apt to eat it immoderately. With regard to the coffee, it is a pity, indeed, if a few bushes cannot be given up for the sake of the shade and ornament which the mango affords; and, with regard to the negroes, it is held by other planters that the fruit is good for them, and does them no manner of harm. I suspect that the whole question of benefit or hurt, depends on the moderate or immoderate use of the fruit.

*Musa*.—Two species of this genus, the *Musa sapientum*, or Banana, and the *Musa paradisiaca*, or Plantain, are cultivated in Cuba, as in most tropical countries. The Spanish name for both the banana and plantain is *Platano*, while the French name for both is *Banane*. It is common however, in the latter language, to distinguish the banana by calling it *Figue Banane*, and to designate the plantain by the term *Grosse Banane*. The Spaniards, according to La Sagra's catalogue, apply the term *Platano hembra* to the plantain, and *Platano Guineo* to the banana. Some botanists regard them as varieties only of the same plant, and not distinct species. However this may be, it is convenient to speak of them as distinct species, and there are certain slight marks which distinguish them from each other. The stem of the *M. sapientum*, or banana, is spotted with purple; that of the plantain is uniformly green. The fruit of the banana is smaller and more delicate than that of the plantain, though perhaps the latter is more in request as an article of food. The fruit is occasionally seen in our market, and is more common in the markets of the cities to the

south of us. It is not necessary, therefore, that I should describe it, farther than by saying that it is of a long oval shape, somewhat curved, pointed at the ends, of a yellow or purplish colour when ripe, and of a sweet luscious taste. The outside skin readily peels off lengthwise, and the rich pulp then presents itself, of the consistence of butter. It is eaten raw, or cooked in various ways. The stem of the plant is not woody, but consists of the footstalks of the former leaves wrapped round each other, and it rises to the height of twelve or fifteen feet. The leaves are very large, of a long oval form, five or six feet in length, and of a beautiful green: the middle rib of the leaf is tough and strong, but the rest of its substance is thin and delicate, and is easily torn by the wind alone, in a direction of right angles with the rib. The manner in which the food is developed is quite interesting. From the midst of the leaves, and at top, appears a large smooth purple cone, hanging down gracefully at the end of a stalk. The flowers are all wrapped up in this cone, which consists of a large number of closely packed spathes. By and by the uppermost of these spathes disengages itself from the rest, curls up, and discloses a row of three or four long blossoms, with the young fruit of each beginning to form. While this row of fruit is tender, the spathe remains hanging over it like a roof; but when the fruit has acquired some size and strength, the protecting spathe drops off, and the next in order rises up, with a similar row of young fruit, over which it stands in the same watchful attitude, till it also drops off, to be succeeded by another. When one circle of fruit is completed, another is commenced below, and in due time another; while the common stem around which the fruit is disposed, grows constantly longer, and the cone of spathes is constantly diminishing in size, till it is all unfolded, and a monstrous bunch of bananas is finished, which seldom weighs less than twenty or thirty, and sometimes as much as seventy or eighty pounds. Of all kinds of vegetable nutriment, the banana is perhaps the most productive and most easily raised. After a plant has produced its bunch of fruit, the stem is either cut, or is suffered to wither and fall on the spot. In the former case it is good fodder for cattle; in the latter, it is good manure for the young shoots which have been springing from the root, and which are soon ready to bear fruit in their turn. From these shoots or sprouts the plant is propagated.—There are several varieties both of the plantain and the banana. The banana which comes from Tahiti is among the very best; the East India name for the genus is *Pisang*.

*Passiflora*. — The seed vessels of several species of the *Passiflora*, or Passion flower, are palatable fruits in countries where they come naturally to perfection. This fruit is called Grenadillo or Passionario by the Spaniards, and Grenadille by the French; which name has been also adopted by the English, with a slight difference in termination, who call it Cranadilla. The Spaniards of South America, however, and perhaps also of Mexico, give quite a different name to this class of fruits, terming them Parchas. With one species of granadilla I became well acquainted, the plant which was, I believe, the *Passiflora quadrangularis*, was a most luxuriant vine, clambering over a wild orange tree, and so completely enveloping it as hardly to suffer a twig to make its appearance. Its growth was so rapid, that it could almost be seen, and, as it grew, threw out fresh flowers; while hanging about in all parts of this natural arbour was the fruit, in all its several stages up to ripeness, when it was the size of a cantelope melon, say seven or eight inches by four, it was of an oval form, smooth like an egg plant, and of a yellowish green colour when ripe. Within a tender rind a quantity of blackish seeds swim in a transparent mucilaginous pulp, of a rather pleasant sub-acid flavour.

*Persea gratissima*, formerly *Laurus Persea*. — No fruit enjoys a greater wealth of names than this; and therefore it is rich in more senses than one. It is the Alligator Pear of the English, which name Alligator is only a corruption of the *Avocato* or *Aguacate* of the Spanish, or *Avocat* of the French. It is also called the Vegetable Marrow by the English, a name which well designates its quality. In Peru and Mexico it is most commonly called *Palto* or *Palta*; and Grainger gives us yet another, which he says, is the Indian name, when he terms it in his poem the “rich Sab-baca.” The tree is of middle size, and looks so much like our sassafras tree (*Laurus sassafras*), that it might easily be mistaken for it at a little distance. In this resemblance it is true to its family connexion; for it is one of the laurels, and is therefore closely allied with the sassafras, as well as with the bays, the cinnamon, and the camphor. The fruit looks like a very large, long pear. It is of two or three varieties, red, purple, and green, of which the green is the best. The pulp is yellow, of a firm but very rich and delicate consistence. “When ripe,” says Grainger in a note, “the skin peels easily off, and discovers a butyraceous, or rather a marrow-like substance, with greenish veins interspersed. Being eat with salt and pepper, or sugar and lime juice, it is not only agreeable, but highly nourishing; hence Sir Hans Sloane used to style it

Vegetable Marrow," It was once thought to be worth a voyage from Europe to the West Indies to taste of this fruit; but now, its ancient fame is somewhat diminished, though it is still considered a great delicacy. It seems to have the character of a vegetable rather than a fruit, and is more highly appreciated by some palates than by others. As the Aguacate does not ripen till summer, I had not the opportunity of giving it a trial. I saw many of the trees, however, and some specimens of the fruit which had attained a large size. Imbedded in the pulp is a large rough seed or stone, the juice of which stains a violet colour, and is sometimes used for marking linen.

*Psidium*.—Of this genus, which is of the natural order Myrtaceæ, two fruit-bearing species are commonly mentioned as belonging to Cuba, the *Pomiferum* and *Pyriferum*; the fruit of the former being shaped like an apple, and that of the latter like a pear. It is the Guava, or, as it is variously written by the French and Spanish, *Guiava*, *Gouyava*, *Gua-yaba*, *Goyabe*, &c. The tree is small, looking something like our cherry tree when young; though the leaves of the guava are larger and longer, than those of the cherry, and more thinly scattered on the tree. It is natural to Cuba, and is of a pertinacious life, covering and usurping the ground on which it is permitted to settle. The wood is close-grained, heavy, clothed with a smooth, reddish coloured bark. The blossom is white, and resembles a plum or cherry blossom, or, more nearly still, a large myrtle flower. The fruit which makes such a fine and celebrated jelly, is not so very desirable in its natural state, though by some it is esteemed. I happened to see but one species, but of this one I saw many specimens: the fruit was nearly round, and, when ripe, of a greenish yellow, resembling more nearly a ripe lime, as I thought, than either an apple or a pear. It was so like a lime, both in shape and colour, that at a little distance, I should easily have mistaken it for that fruit. It had a tender rind, about a quarter of an inch thick, within which was the pulp, of a pink hue, crowded with small, triangular, yellowish seeds. The flavour of the fresh fruit is like that of the jelly made from it, but much more powerful, so that one of them, cut open, will scent a large room. The name *Psidium* is from the Greek *Psidion*, which was the ancient name for the pomegranate, to which the guava has some resemblance. There is a wild guava, *P. montanum*, the fruit of which is small, and not fit for food.

*Punica granatum*.—The Pomegranate grows well in Cuba, but is a native of the old world. It flourishes abundantly on the northern coasts of Africa, especially in the Carthaginian dis-

trict, from which country it derives its generic name. The ancients called it *Malum Punicum*, or the Carthaginian apple. Its specific name appears in the English Pomegranate, or apple full of seeds, and also in the French *Granade*, and the Spanish *Granada*; the tree, or bush, is common in our greenhouses, and the fruit is now and then to be seen in our market. I will only say of the former, that it resembles in appearance, as it is also naturally allied with, the bushy plants of the order Myrtaceæ; and of the latter, that it is round in form, terminated with a tall and deeply cleft coronet, and full of small seeds which are enclosed separately in portions of a transparent red pulp, firm, glistening like rubies: these grains furnish a refreshing juice, in which sweetness and acidity seem blended in equal proportions: the ripe fruit, sometimes bursting and disclosing its gems, the shapely green fruit, the rich red blossoms, all hanging together on the slender pensive stems of the bush, form one of the pleasantest garden sights.

*Tamarindus occidentalis*.—*Tamarindo*, the *Tamarind*. I have employed the specific name *occidentalis*, because it has been adopted by late botanists to distinguish the West Indian tamarind. As it seems to differ, however, from the *Tamarindus indica*, or East Indian tamarind, in no other respect than merely having shorter pods or fruit, it hardly deserves to be esteemed but as a variety of that species. It is one of the Leguminosæ, and the tree has all the appearance of a fine spreading acacia. It grows fast, and yet is long lived, and its wood is hard and durable. The fruit is a pod, like a full, ripe pea-pod, with a thin crisp, russet skin or shell, which covers a reddish brown pulp, and shining, mahogany-coloured seeds, which are embraced by a net of tough fibres, proceeding from the fruit-stalk. The pulp seems to need no preserving process, for when fresh it has all the appearance of a marmalade. When eaten directly from the tree, its sugared acidity is agreeable to the palate and refreshing to the senses. Steeped in water, it furnishes a cooling and grateful drink in fevers. The old writers are loud in its praises, and ascribe to it, together with its real good qualities, properties which it can lay but slight claim to. At any rate, it is pleasant and innocent; and it is so commonly to be met with in our shops, that there is no want of opportunity to test all the virtues it may have. The beauty of the tree is increased by its blossoms, which hang in bunches, with red and yellow petals, and of an agreeable fragrance. The following curious account of the derivation of the name *Tamarind*, is from Burton's *Outlines of Botany*:—"The date, called *Tamar* by the Arabs, being their most common and valuable fruit,

other important fruits have been called dates, or tamars likewise, with some distinctive epithet adjoined. Hence the one in question received the name of Tamar-hendi, the date of India, whence our word Tamarind. Ignorance or neglect of this circumstance led botanists to add *Indica* as the specific name, to a generic one in which the habitat of the plant already was included." Considering, therefore, that *Tamur-indus Indica* is a vile "pleonasm," Burton proposes to call it *Tamarindus orientalis*, in distinction from the *Tamarindus occidentalis*.

*Theobroma Cacao*.—This is the plant which produces the Cacao, or Chocolate-nut of commerce; and it is important that the true spelling and pronunciation of the word should be attended to and preserved, in order to prevent the confusion arising between this and the coco or cocoa, which is as different a fruit as possible. The nut from which chocolate is made is the cacao, and not the coco; and the tree which bears it, instead of being one of the palms, is classed among the mallows, and is connected with the cotton shrub and tree, the linden, and other plants of that type. The tree is of rather small size, with large, long, oval pointed leaves, strongly ribbed, often assuming a dark purple colour. The flowers are small and star-shaped. The fruit is of a long oval form, pointed at the end, ribbed like a muskmelon, and bearing some resemblance to a small specimen of that fruit. When ripe its rind is yellow. Cut it open, and you come to a soft, white, spongy pulp, of a rather pleasant subacid taste, which separates wholly from the rind. The valuable seeds are wrapped up carefully in this pulp, in separate envelopments, in considerable numbers, and are of a lively red colour before they are dried, when they turn to a duller hue, which is well known as chocolate colour. A singularity, with respect to this fruit, still more marked than in the case of the guanavana, is, that it grows out directly from the bark of the large branches or trunk, hanging thereto by a short, fleshy stem. I have seen it clinging to a stout trunk, within a foot or two of the ground, without a twig or leaf near it. It is unnecessary for me to say anything of the value of the cacao. When first discovered by Europeans, it was greeted with boundless eulogy, of which its generic name, *Theobroma*, signifying food for the gods, is a standing testimonial. In Mexico, and parts of South America, the people could hardly live without their chocolate, or chocolatl, which is the Mexican word; and it is calculated by Humboldt, in the year 1806, that twenty-three millions of pounds of the cacao were imported into Europe, the greater portion of which was used in Spain. Chocolate is nothing more than the cacao seeds

bruised and ground into a paste, and sweetened and flavoured according to the fancy of the manufacturer and demands of the consumer.—*Bost. Jour. of Nat. Hist.*

#### CORRESPONDENCE ON HORTICULTURAL SUBJECTS.

VILLAGE SOCIETIES FOR GARDENERS.—The following though it appeared years ago, has been the means of originating many similar institutions:—"It is not generally known that the gardeners residing in a little village in Essex, have formed an institution denominated the 'Mutual Instruction and Reading Society of Leyton,' for the purpose of keeping pace with the progressive intelligence of the age. They have one large room, which is open every night from six to ten o'clock, except Sunday. They have a library, formed by each member lending for the use of the room such books as he may be possessed of; and they take in useful periodicals. Lectures are occasionally delivered on various scientific subjects by members, and discussions are held once or twice a week upon any subject, except politics and religion. This society has done much good. I should wish to see all gardeners, and in fact, all men, unite for so worthy an object in every village in the kingdom." The most important, however, is one in Knightsbridge, where in addition to all this there is a penny subscription towards a fund for the relief of temporary distress occasioned by accident or misfortune of any kind.—H. C.

TESTING POTATO SEED.—From the now general diseased state of the Potato, it appears to me that there is but one way to test the seed before planting, but which, if properly attended to, will prevent those melancholy results that may be anticipated in the crop. It is this,—Select from the Potatoes proposed for seed a dozen or two; cut them with a sharp knife into sets; then put them on the floor of a potato-house, or any other place free from damp, with the stem next the floor; if, upon examining three or four days after, it should be found that the incision has dried up, and is covered with a kind of new skin, be assured that the seed is wholesome; plant it; but if, on the contrary, the wound is found to be wet, sluggish, and spotted, be certain that the constitution of the Potato is exhausted. This experiment should not be tried until vegetation has completely taken place; say about the middle of April.—S.

SWEEPSTAKES FOR CARNATION.—An interesting match came off at Stockwell, between Messrs. Dickson of Acre-lane, Keynes of Salisbury, and Bates of Oxford, each mentioned a number of flowers, from which they engaged

to show twelve for a sweepstake of five guineas; this came off at the last meeting of the Surrey Horticultural Society, when Mr. Dickson was declared victor with the following twelve varieties: — Mr. Dickson's dozen: — Wilson's William IV., Brook's Flora's garland, Twitchett's Don John, Willmer's Solander, Hero of Middlesex, Iron's Queen Victoria, Rainforth's Game Boy, Ely's Lord Milton, Mansley's Beauty of Woodhouse, Puxley's Prince Albert, Chadwick's Brilliant, Wood's Rosabelle.

**HINTS TO GARDENERS.**—It is necessary to premise that I was apprenticed to a nobleman's gardener in the North of England. Having paid a fee of twenty pounds, I remained there for three years, was then advised by the head gardener to visit London to acquire a knowledge of the modern improvements of gardening. After some time I obtained employment in a nursery, and had an opportunity of visiting noblemen and gentlemen's places within ten miles of London, and from what I see of my brother gardeners, I now entertain quite different ideas to what I held in the country. I expected when I visited London to see young men desirous to improve by availing themselves of every opportunity of hoarding up a stock of useful and scientific information for practical purposes at a future time. I expected to see gardeners who fill respectable situations competent to assign reasons for most of the operations they perform, but it is with regret, I must confess, that I find the young gardeners more desirous to amuse themselves with frivolities, as I know a few lamps placed against the houses in town on any of the many birthnights of royalty will be more attractive than the best lecture that ever was given on any of the manifold subjects of their profession. I walked a long distance to hear Professor Johnson deliver two of his series of very excellent lectures. Free admission was generally given to gardeners, but I regret to add that I saw very few avail themselves of the kind privilege. In my conversations with young gardeners, they all generally express a desire to get out to head places for themselves; the great supply in the London market, many of them ready to grasp at any situation at any price, must drive from such competition men who have acquired sufficient information to avail themselves of any other more respectable and lucrative employment. The supply of labour, mental and corporeal, is regulated like every other marketable article, according to the scarcity or plenty of the material; and as there are several establishments in the country where the head gardeners are notoriously in the habit, through their connexion with nurserymen, to manufacture gardeners by dozens for

the London market, it is no wonder that we see such raw specimens presented to our notice, claiming the privileges of gardeners, and by their competition depriving more worthy individuals of the benefit of their experience and acquirements. I find that gardeners are generally too willing when they leave their places to attribute the cause to the caprices, whims, or fancies of their employers; but the real fact I believe to be, that their employers, by visiting other places, by attending exhibitions, of fruits, vegetables, and flowers, and, above all, by reading your's and other excellent works on gardening, have acquired so much knowledge as easily to detect the deficiencies of the person they engage as gardener, and on that account he is sent to condole with his companions in misfortune, when they unanimously agree to think that gardening is *now* a very bad business. A reader may be inclined to ask me how I could correct the evil?—my answer would be, to remove the cause by holding up to public notice those head gardeners who are so avaricious as to cajole young men out of their money by fair promises, and then to send them on the world destitute of any acquirements to fit them for any thing more than to become "hewers of wood and drawers of water." Although I know the generality of young gardeners about London to be as I describe, yet I am proud to say, there are a few noble exceptions to the general rule. Young men whose whole study it is, at every opportunity both by day and by night, to read and to reflect upon the causes and effects of their professional operations, to associate with companions of kindred minds, and by mental cultivation on practical subjects, to keep pace with the taste for gardening which is now becoming so general amongst the highest circles of society in Great Britain.—W.

**THE HARDY TRELLIS PLANTS.**—I send from a source which is doing much good all over Ireland, the following list of Trellis plants that will stand the winter. The source I obtained it from was the Gardeners' and Stewards' Provident and Mutual Instruction Society, whose transactions are of the highest importance to the sister kingdom, and whose example ought to be followed by the Gardeners of England:—*Clematis*, Florida, double and single; *C. flammula*, sweet scented; *C. viorna*, (purple;) *C. montana*; *C. australis* (white,) *C. vitalba*, or traveller's joy. Bramble, cut leaved, (white;) *B. variegata*, (white;) *B. white fruited*, (white.) *Passiflora*, *cœrulea*, (blue.) *Coronilla emerus*, or scorpion senna. Virginian creeper; *Calampelus scabra*, (yellow.) *Cœnothus*, *azureus*; *C. cœruleus*. *Acacia*, *armata*; *A. verticiliata*. *Corræa alba*. *Wisteria consequana*, *Clanthus punicea*. Es-

challonicæ rubra; *E. rubra* var. *alba*; *E. viscosa*; *E. bifida*.

To this from the same source I add a list of plants suited for trellises, but which must be kept under protection till the end of May or the beginning of June:—*Plants suited for outside Trellises not to be put out of Green-house until May or June*.—*Petunia*, *nictiginiflora*; *P. violacea*; *P. intermedia*. *Tropæolum*, *tuberosa*; *T. pentaphylla*; *T. aduncum* or *canariense* *Chrysanthemum* in sorts; *rhodochitons* in sorts: *cobæa scandens*; *dolichos lignosus*; *maurandia* in sorts; *loasa litteritra*; *lophospermum* in sorts.

PLANTS FOR THE FRONT OF A COTTAGE, OR ANY OPEN SPACE OF WALL.—Amongst the many plants suited for the purpose we have mentioned, we note the following: *jasminum revolutum*, (yellow flowered); *pyrus japonica*, (scarlet flower); *Macartny rose*, (white flower); *pyracantha*, (scarlet berried); moss rose, (rose coloured); *spiræa bella*, (pink flower); *corchorus japonica*, (yellow flower); double flowered blamble, (rose coloured); *Fuchsia Baxterii*, *F. conica*, (red flowered); *Loincera*, (honeysuckle), evergreen, (pale yellow); *L. flexuosa*, (whitish); *L. speciosa*; *L. flavum*, (yellow); *L. pubescens*, (bright yellow); *L. italicum*, (white); *L. sempervirens*, (scarlet trumpet); *L. periclymenum*, (yellow.) *Ribes*, (currant); *specioso* (red); *R. sanguinea*, (blood coloured); *R. aurea*, (yellow).—*Transactions of the Dublin Gardeners' and Stewards' Society, forwarded by B. B.*

PASSIFLORA CÆRULEA.—*Common blue Passiflora*. The above plant was introduced about the year 1699, from the Brazils, since which it has become a hardy plant in this country; it is well known, ornamenting the houses occupying a south-west aspect in Baggot-street, Dublin; bearing beautiful light blue flowers, afterwards with egg-shaped fruit which become of an orange red during autumn, and remain during winter and often late into the spring following, and are very ornamental. I have been frequently told that it would not do so well any where as in Baggot-street; but I am perfectly satisfied from frequent observations on the above, and find many other situations equally suitable; for instance, where the situations have nearly the same aspect on Charlemont-mall, Carysfort-avenue, Black-rock; Dr. Symes', Sussex-parade, Kingstown, and many other places; where great care has been taken in keeping it properly nailed. Since the introduction of the above, there has been several varieties raised from seed, as hybrids, but I doubt whether they are equally hardy, their names are as follow:—*P. Cærulea racemosa*; *P. C. angustifolia*; *P. C. palmata*; *P. C. glaucophylla*; *P. C. Colvillii*. N.B.—It

seldom flowers until the second year after planting, but more frequently in the third and fourth year; the latter of which it generally bears fruit.—*J. R., Member of the Gardeners' and Stewards' Provident Society of Ireland.*

OLEA EXCELSA.—Introduced from Maderia in 1784, although a very hardy evergreen resembling the Portugal in growth; but its foliage of a much lighter shade of green; which renders it more conspicuous when planted amongst other evergreens; it seems to have been much neglected, its progress having been very slow since its introduction owing to neglect of propagation; it grows freely from layers, and likes a dry gravel soil with moderate shelter; I have known it to attain 20 feet high in growth, although, according to "London's Hortus" in Madeira, its medium height is but 15 feet; the flowers are white; it is a very ornamental evergreen, particularly where contrast is an object; it is a rare plant in many collections in this country; whether it will bear fruit in our climate or not, will require some time to determine.—*James Rollins, Corresponding Member of the Gardeners' and Stewards' Provident Society.* As the Society founds its advice on practice alone, these hints may be useful.—A. R.

THE PEACH AND THE NECTARINE THE SAME SPECIES.—December 1, 1835. Planted twenty stones of Peaches, which had been kept in sand since August last.—September, 1839. These stones came up the following summer; one of the trees bore fruit in 1838, and proved to be a nectarine of excellent flavour; another tree fruited this year (1839), and is also a nectarine (free stone) of excellent quality; proving the correctness of your opinion, "that the peach and nectarine are essentially the same species." Query? As far as this goes, is it not evidence that the smooth-skinned peach, or nectarine, is the more original?—*T. C. Brown.* [We have already recorded abundant evidence that the peach and nectarine are the same species, and have gathered nectarines ourselves from peach trees. And the fact now recorded goes far towards establishing that the nectarine is the original, for all seeds have a strong disposition towards producing the original species, or to what in apples, pears, &c. we should call degenerating again to the wild ones.]

CABUL MELONS. — "I remember being greatly surprised at the Editor of the *Chronicle* recommending to every body who values his dessert to expel the whole race of *Cantaloupes* and *Rock Melons* as unworthy of a modern garden. I was very desirous to obtain some seed, and this season I had the good fortune to have my wishes gratified by a gentleman in this neighbourhood, who presented me with four



seeds he had received direct from his brother, an officer in the Indian army, and one of the survivors of the Cabul affair. I need scarcely say that I grew them with great care, and was not a little pleased on perceiving one of the fruit exhibit signs of approaching ripeness. On tasting it I must freely acknowledge that, notwithstanding the little partiality I entertained for my old favourites, I found there was almost as much difference between them and the Cabul Melon, as there is between a Morrello and a May Duke Cherry. The fruit proved to be remarkably handsome, of an oval shape, slightly netted, and tinged with yellow previous to becoming ripe. The flesh was white, with a greenish tinge, apparently firm, but melted in the mouth like a lump of sugar. The skin was thin, and on this account the fruit as it approaches maturity requires to be narrowly watched, as it is apt to crack and shortly afterwards begin to decay. I am now of opinion that these Melons, in the course of a few years, will supersede the very best kinds that are at present in cultivation."—The substance of this appears in the *Chronicle*, and shows the recklessness with which people go from one extreme to the other. I have had well authenticated Cabul seeds from several persons, and not two alike; I was at the cutting of one (affirmed by the grower to beat the Cantaloupe and Rock) probably because he had read the *Chronicle*, but he could not persuade any of us that he was right; we had green flesh, the Windsor prize, and early Cantaloupe to try with it, but although it was better than our green flesh specimen, it was not better than the Cantaloupe, and not so good as the Windsor prize. Talk of Cabul Melons, they have as many different sorts as we have almost, and as many different qualities.—A BUCKS GARDENER.

**JUNIPER TREES.**—The earliest mention of the Juniper tree is to be found in the first book of Kings, about nine hundred years before the Christian era, when the prophet Elijah took refuge in the wilderness of Beersheba, to avoid the persecution of King Ahab. I hope they made a better use of it at that time than they do now, when its berries are consumed in the manufacture of gin. The junipers are a pretty race of trees, and form beautiful objects in good plantations.—M. A.

**NEW FUCHSIAS.**—It is said by a garden newspaper, no matter which, that Fuchsia Lowryi is a beat upon Formosa elegans. Now I do think that these newspapers should be made responsible for positive assertions like this. It is not long since a large portion of the floral world was taken in by a similar assertion. For months we were told that a certain new flower was a beat upon a certain good flower, and we bought upon the faith of it;

every one of us were completely taken in. All I have to say here is, that the plant in question is not a beat upon Formosa elegans; and according to the properties laid down in *The Gardener*, is by no means so good. I wish somebody would make an example of the parties who aid in deceiving us with these.—D.D.

**PRETENDED JUDGES OF FLOWERS.**—It appears to me that by encouraging the editors of journals in giving opinions on florists' flowers, we are doing the most silly thing in the world; they make fools of themselves, and we of one another. Just imagine one fool sending a flower to another fool, who says—"Your Calceolaria is a bright yellow, with deep brown spots, rather larger than the average size;" or—"Your Fuchsia is large, with bright crimson sepals, and corolla of the same colour;" why any fool who saw the flower could have told that. The man who sent these flowers knew that quite as well as the person who scribbled the character. One says of a Fuchsia, "the bunches are very large, flesh colour, with pale green sepals;" could not the man who sent it have told the writer all this? I must say I never was half so much deceived before these scribbling gentry were applied to, as I have been since, and I greatly regret the practice has been kept up by those who are weak enough to appeal to people whom it is impossible to place confidence in.—R. T., Junr. [We wish our young friend would point out some instance in which we have been either half so stupid or half so mischievous, as the people he describes. We verily believe that our correspondent has been deceived, but he should draw the line between those who have never been wrong, and those who, unless they copied us in idea, have never been right.]

#### GUANO, ITS ACTION UPON THE GROWTH OF PLANTS.

THE ultimate object of vegetable life appears to me to be the production of seed;—to this purpose, and to accumulate the properties and ingredients for the formation and perfection of this seed, the root, stem, leaf and flower are devoted, each performing its destined gradual part, until by their united efforts, brought into action by soil, light, heat and moisture, this object is attained; exterior vegetable action then declines until another season. Experiment has shown that plants grown on mere sand, with the assistance of water, will throw out stem, leaf, and flower, nay even the forms of seed, but these will be mere integuments, empty vesicles or little bladders—also that by constantly stimulating, with peculiar manure, we can throw plants into such uninterrupted

luxuriance of shoots and foliage, that often the flowers, and more often the seeds, do not appear within the limits of the season. Combining these views with others on the production of double flowers, and with some suggested by various experiments on Guano, it seems to me highly probable that certain manures are particularly conducive to a luxuriant growth of stem and foliage, while others are peculiarly so to the production of numerous and well filled seeds. As it would be impossible for me, at the present moment, to develop all my ideas and experience on this subject, I will endeavour briefly to elucidate it by a supposition, which, like those in algebra, may or may not be near the truth. Suppose the nitrogenous (*ammoniacal*) and alkaline (*potash and soda*) manures to be those chiefly instrumental in producing stem and foliage, then nitrate of soda will be valuable for this purpose, and if the soil itself contain the ingredients of the seed in a fit state for absorption, the plant thus thrown into a state of luxuriance will be enabled to draw from it sufficient to make plenty of good seed. But if the soil in itself contains them very sparingly, then this excess of stem and foliage, although containing a quantity of nitrogenous and palatable food for cattle, will be deficient in rich seed. Now we know that phosphate of lime and of magnesia, with sulphurous compounds, exist in all seeds useful to man and animals—these, however, do not form part of nitrate of soda and potash, hence the latter can only assist the plant in extracting them from the soil.—Suppose secondly, we use a manure combining the nitrogenous principles in the shape of urates, &c. with the alkaline phosphates, sulphates, muriates, &c., then even on the poorest soil, while the ammoniacal portion is performing its office of causing luxuriance in foliage and stem, the ingredients of the seed are offered in abundance to the root. This is exactly the predicament of Guano—most of the salts in which are soluble in water—and those which are not, such as the phosphate and oxalate of lime, become so when combined near the roots with the carbonic acid furnished by the humus as well as by other portions of the manure. The use of a solution of Guano in water is therefore good, when the seed is not required; but where it is, the deprivation of the insoluble phosphate of lime is very injurious. Hence, from the proper use of Guano, a luxuriant vegetation is followed by the production of a large crop of fine seed. As a farther elucidation of my views, I will state that the manure made use of for the purpose of producing double flowers, is the highly nitrogenous stable manure, which is used in such a quantity as to prevent the roots from

coming into contact with that part of the soil containing the ingredients of the seed—this manure being then chiefly favourable to the production of foliage alone, if continued through many generations, will by degrees convert the stamens, pistils, and the parts destined by nature to prepare the seed, into leaves or petals, and finally obliterate the seed. These flowers, if grown in a poor soil, scarce in nitrogenous substances, will again, as is well known, revert to their normal single seed bearing state. Several of my experiments with Guano proved to me that it shortened the internodes, or portions of the stem between each leaf; this was particularly evident in seedling orange and lemon trees, and is a sure indication of fruit or seed bearing; indeed, the spurs, which are well known as the fruit producing parts of many trees, are but shortened branches where the internodes are reduced to a mere nothing, and where, consequently, the axillary action is concentrated into a small space. I have, therefore, no doubt of the beneficial action of Guano on fruit trees. Many experiments are, however, yet desirable. Such as, whether Guano acts beneficially on the receptacle of the seed, which is the fruit of the strawberry and raspberry; whether on the exterior covering of the seed, which is the apple, peach, plum, &c.; or on the kernel or nut, or on the pulpy envelop of the seed, as the gooseberry, grape, melon, gourd, &c. I hope that these ideas will give rise to numerous experiments next year, and that those who make them will not hesitate freely to communicate them for the general benefit. I will merely add farther, that I should consider it advisable, in all experiments on fruits, to try both the Guano itself as well as a weak solution of it in water—it is highly probable that the solution will be efficacious where the receptacle or the exterior of the seed is most valuable, whereas in corn, peas, beans, &c., those phosphates which are insoluble in water, and are very necessary, would be thus lost to the plant. At another period I may possibly resume this subject, as it seems to me that these ideas open new views on the physiology of plants, and certainly show of how much importance it is for those who study this subject to become better acquainted, from personal observation, with the action of the soils on vegetable life. It is from the want of this knowledge that the greatest errors have been prepared and propagated as truths by scientific men. *J. E. Teschemacher to Messrs. Hovey, Boston.* We have in some cases to make allowance for the difference of climate, but on general subjects our American friends give useful information.



CAMPANULA MURALIS.

THIS interesting little plant is, of all the (so called genus *Campanula*, the least entitled to its name, which implies a bell flower and nothing else. But what's in a name? It grows only six inches high as a native of Europe. Introduced to England in 1835. Romer and Schultes called it *Portenschlagiana* a name not likely to be so popular as the one we have given above. It is a perennial, and flowers in September; it is cultivated in a cold frame, the roots may be parted, or cuttings will strike in bottom heat. It is probably hardy, but we have not heard of its being tried. The colour of the bloom is a sort of lilac, and there being a large quantity of flower in proportion to the height and size of the plant; it is a gay species of dwarf habit; the leaf is not much unlike that of the Chinese Primrose, or *Primula Sinensis*.

#### THE FAVOURITES OF THE FLOWER GARDEN.

MR. FRANCIS, the author of this little volume, has been more successful in his Floral and Botanical works than many who make more noise, and the present subject is as neatly written and got up as his work on the Ferns, or his *Little English Flora*. His preface is written with a spirit of candour which entitles it to some attention, and gives some notion of the task he has set himself. It is our province to say, that he has performed it well. He says—

“Having occasion some years since to select some botanical books for the introduction into a ladies' school, my search impressed me with the idea that those written for study were either shallow, like *Priscilla Wakefield's*; or abstruse, like *Dr. Lindley's*—not more abstruse perhaps than a person of mature intellect would desire, but still too much so for the young; while the whole of them, without I believe an exception, are written as

if the author considered the acquisition of a few difficult terms to be all in all.

“I take a different view of these matters, and the eulogium I may be said to have passed on the subject of plants, in the introductory chapters of my various books, are my real sentiments as to the uses of the science of botany, and the delights the study of it is capable of affording. Learning of all kinds is but a means towards an end, and that end is the happiness of ourselves, and the benefit of others.

“Applying this observation particularly to the examination and cultivation of flowers, it would follow that a botanical book should at the same time teach the technical part of the science, show its applicability to useful purposes, and direct attention to those marvels and beauties which the young particularly take delight in contemplating; and the examination of which tends so essentially to improve and enlarge the intellect, and to soften and humanize the feelings. If this can be done, and at the same time the thoughts relieved, and the fancy quickened by anecdotes, poetry, and cursory useful reflections, so much the better. Amusement and instruction should always go together where it is possible, and in botany it is essentially requisite.

“I have born this in mind while preparing all my botanical works—two of which are of the same description as the present. My “*Grammar of Botany*” is a plain and comprehensive account of vegetable structure, physiology, geography, and classification. My “*Little English Flora*” gives a botanical and descriptive account of our common wild flowers, arranged according to the Artificial System of Linnaeus. The present book in like manner treats of our common garden flowers, arranged according to the more modern classification known as that of Jussieu, or the Natural System. It would be found to explain the characters of more than fifty of the most valuable orders of plants. In these various orders are described about one hundred and forty genera, and more than twice as many species—each genus being illustrated with an engraving, and each order by a wood-cut of its characteristics, with introductory and concluding explanations: so that it is hoped the reader, however young, will by its assistance be enabled readily to examine and classify the ordinary favourites of the garden, without more trouble than will give zest to the employment, and convey a healthy tone to the mind.

“The plants described are such as are most generally met with in ordinary gardens, and which are yet so beautiful as to be allowed a place in the parterres of the wealthy. In number there are about 300—a sufficiency it is hoped to communicate to the tyro a wide field

for examination and study, and such an one as cannot fail to communicate a pretty extensive knowledge of the fundamental principles of the science of botany, and particularly of that system of classification, the value of which stands pre-eminently before all others. This system is admittedly attended with difficulties, but these are, as far as possible, removed by the illustrative wood cuts, and by the general remarks that attend them. What plants ought to be introduced into a book of this nature, and what should be excluded, will always be a matter of opinion; thus for a garden in the north, and for another in the south of the kingdom—for one on the sea coast, and for another inland,—very different plants are required. Bearing this in mind, my selection has been directed first to those which are common everywhere, such as the Pink and the Lily; next to those plants, which, although not of universal culture, are yet of interest on account of their beauty, or the historical and literary associations connected with them, as in the case of the Fuchsia and the Passion Flower. Some plants, although natives of our own country, and still growing wild in our hedge-rows, woods, and pastures, and therefore of necessity introduced into "The Little English Flora," it has been impossible to omit; for who would forgive an author, who, in describing the favourites of the garden, should omit the Violet, the Lily of the Valley, the Snowdrop, the Eglantine, or the Honeysuckle, yet these, and numberless others, are natives of merry England, and introduced into our gardens on account of their sweetness or loveliness—yet even in these instances the descriptions are totally different from those otherwise published; thus instead of the interest in these plants being diminished, I sincerely hope it will be increased by this refresher of their charms.

"In publishing this volume I complete the last of the three works I originally contemplated on the subject of botany, as recommended to the young. They are such as I in vain looked for some years since, and whatever merit or demerit they may have, I can only state, that in preparing them I had my mind directed to the education of my own family. I have therefore inserted only those important facts which show the usefulness of well-directed knowledge, that miscellaneous information which renders such facts easily remembered, and those sentiments and reflections which I shall be proud for them, and for all my young friends, to adopt; while the whole will, I trust, give a thirst for the knowledge of the Creator's works, and a tendency to look from them to Him who made them all, and who, viewing all the objects that he had fashioned, "saw that they were all good."—G. FRANCIS.

The Introductions to Botanical study are for the most part wrongly named, for unless people have a tolerable knowledge of it before hand, the so called introductions are anything but what they require. The following is the introduction to the volume now under notice—

"The mere definition of a science like this forcibly expresses its utility and extent. There are in the world perhaps 100,000 species of plants, all distinct from each other—some evanescent and almost too small for sight; others gigantic, and enduring longer than human records. Their properties are more numerous than even our physical wants: their forms and colors more varied than our fancy can imagine; and their structures more perfect than our reason can explain: while all are subservient to the general design of their Great Creator, in rendering the globe a fit and beautiful habitation for mankind.

"A moment's reflection will impress upon our minds the value of this beautiful department of nature. Where do we obtain our food, fuel, clothing, or habitation, but from the vegetable kingdom? Ask the merchant for his ships—the miner for his coals—the physician for numerous of his drugs—the weaver for his cotton, his flax, and his hemp—ask the mechanic for his implements and his machines, or even the bee for its honey, and the worm for its silk—from what source have we our dyes, perfumes, gums, oils, sugars, and wines? Whence the golden grain and the clustering grape? All these are chiefly, if not wholly, of vegetable origin. And in what an astonishing manner, too, are all these diversified ends attained. Plants consist of but three or four elements or materials, yet no two species are alike. They may be nourished by the same soil; are invigorated by the same air; stimulated by the same light and heat, yet what remarkable differences are to be observed. Take a single plant, and trace its progress through life, and how full of wonders will it appear. A minute seed is shed upon the earth—it lies apparently lifeless till its appointed season of growth—then the finest fibrils strike into the earth, avoiding the light—the young stem shoots upwards, courting its influence—leaves appear and expand—an extra charm, and one which mankind alone can appreciate, is next given to it in the form of flowers—these decay, and seed or fruit is formed, while during the whole time of this perfect and unerring process numberless combinations are taking place; depositions and secretions are being formed—the functions of absorption, respiration, circulation, and fertilization, are carried on—the most wonderful defences and adaptation to peculiar circumstances are to be observed; and even when dead and changed

to dust, the plant is but resolved into its original elements, and thus become adapted for food to future races.

"And can it be supposed that the mind should remain uninfluenced by a study of objects like these,

' ——— Where every bud is perfect,  
And every leaf contains a folio volume.'

On the contrary. 'Whoever,' says Roscoe, 'has turned his mind so as to comprehend the extensive system of the vegetable kingdom, either descending from generals to particulars, or ascending by a gradual progress from individuals to classes, till it embraces the whole vegetable world, will by the mere exercise of the faculties employed for this purpose, acquire a habit of arrangement, a perception of order, of distinction, and subordination, which is not, perhaps, in the nature of any other study so effectually to bestow; while the bodily senses themselves become highly improved by that accuracy and observation which are necessary to discriminate the various objects that pass in review before them.'

"Independently of the bracing effects upon the system, which rambling in the open air necessarily produces, the mind acquires a more wholesome turn from the consciousness of having some settled and worthy object to which to direct the attention. The pursuit of the botanist may be treated with contempt by shallow minds, incapable of feeling the charm of the employment, and his herbarium designated with the contemptuous character of a repository for weeds; but may he not condemn in turn the trivial pursuits of weaker minds, and pity the unprofitable occupation in which their time has been wasted. If they laugh at him, he may smile at them—the empty laugh of ignorance is met by the quiet smile of conscious superiority.

"Even without a knowledge of botany, flowers are full of charms. How much more so then with it! Eden signifies pleasure, and who can observe the simple beauties of our hedge-rows and meadows, or revel among the sweets of a garden, where are collected the nurselings of distant climes, the aggregated charms of many lands, beholding them in all their freshness and vigour, without feeling a buoyancy of spirit, and a tranquillity of mind, in vain to be sought for in the round of gaiety, or the turmoil of business. We there find the most fascinating colors, harmoniously blended and contrasted; the most ravishing perfumes, and the most chaste, elegant, and varied forms—in short, all our ideas of sweetness, innocence, and tasteful decorations, are inseparable from Flora's kingdom; while, by a multitude of associations, flowers become invested with innumerable spells of powers

over the human heart—not merely here and now, but in all ages and in every clime. The sacred writers have appealed to them as mete instruments of instruction. The Romans were lavish in praise of their gardens. The savage American points with pride to his Magnolia. The Egyptian deified his Lotus and his Papyrus. The Hindoo his sacred Bean. From the earliest periods flowers conveyed a meaning, which ignorance prevented even kings from writing; and were made emblematic of that which prudence forbade them to communicate by words. High-born dames were never without some votive flower wherewith to greet the noble cavalier. The sturdy warrior and the timid bride were equally crowned with flowers. They alike strewed the victor's path and the patriot's grave. Poets have always been lavish in their praise, and indebted to them for some of their finest passages; while the nations of the East have, from time immemorial, told with the voiceless eloquence of flowers, their loves, their hopes, their sorrows.

"Not only is our fancy warmed, and our sentient faculties improved by studies such as these, but the very contemplation of the beautiful objects of which they treat refines our taste, stills the agitated feelings, and impresses upon our hearts peace and goodwill towards man, praise and gratitude towards God.

"Sir Thomas Browne says:—'There are two books from which I collect my divinity; besides that written one of God, another of his servant, 'Nature,' that universal and public manuscript that lies exposed to the eyes of all. Those that never saw him in the one have discovered him in the other. This was the scripture and theology of the heathen. Surely they know better how to join and read these mystical letters than we Christians, who cast a more careless eye on these common hieroglyphics, and disdain to suck divinity from the flower of nature.'

"Let the botanist take up one, no matter which, of the vegetable productions in his path: let him examine it closely and well—observe its beauty as a whole, the wonderful and nicely-adapted combination of its parts—their peculiar functions, the perfect mechanical process by which these are carried on, and the purposes of a highly-important nature they are made instrumental in accomplishing; and he cannot but acknowledge that every thing he sees speaks the language of adoration, proclaims its origin to be beyond the work of man, and from the period of its birth to the moment of its decay is a beauty and a blessing to mankind.

"Of the truth of all this the student of nature must soon become convinced, and the conviction cannot fail to bring to his mind, not

only an ardent and lasting reverence for the Great Author of these bounties; but, at the same time, a more softened tone of feeling. His sensibilities are more widely extended, and become infinitely more acute; the hardness of heart engendered by his communion with the world of man, is dispelled by his communion with the world of nature: that which was cold and barren is become warm and fertile; and from that which was dry and parched is made to gush out a stream of sweet and living waters—a temper of charity and loving kindness to his fellow creatures. The harmonies of nature combine to produce sweet music, and shed around the votary an atmosphere of pure and unsophisticated happiness. He claims kindred with every flower of the field, and feels his own being so blended with these lovely objects, that he exclaims in rapture with the poet—

‘———— Are they not a part  
Of me and of my soul—as I of them.  
Is not the love of them deep in my heart  
With a pure passion!’”

We are bound to say, that we have not given the best portion of the work, for there are brief notices, and very plain and descriptive notices they are, of all the flowers we seem to care about. May the volume be encouraged as it deserves to be.

#### HOOD ON WARMING BUILDINGS.

WE have no book on this important object so complete in all its objects as the volume just published, and now before us. The theory of warming by means of hot water is treated scientifically and practically in a popular and comprehensive manner, so as to render great service to those engaged in constructing houses, and to be highly interesting to those who have such means in use, as well as to others who ought to have, and after reading the book will have it, as the only means of heating. It is almost impossible to do justice to a work of this kind without giving pretty nearly all the marrow of the essay or treatise, for we ought to follow it chapter by chapter, and approve or dispute it as we go—by the way it would trouble us but little on the latter score. Now, as we are not prepared for this, we shall give a sketch of the lesson which the author offers on the construction of furnaces, and strongly recommend those who wish to read the book itself, to lose no time.

The construction of the furnace for a hot-water apparatus, is a matter which requires some care: for although, from the small size of the boilers generally used, the furnace is by no means difficult to construct, it is a very common fault in building them, to allow of such a very easy exit for the flame and heated gaseous matter, that a large portion of the

heat passes up the chimney, instead of being received by the water in the boiler. This arises principally from the shortness of the flues in these boilers, in comparison with those of steam-engine boilers; and in setting boilers for hot-water apparatus, it therefore requires great caution to prevent an unnecessary waste of fuel by erroneous principles in constructing the furnace.

In giving some general instructions on the subject of furnaces for hot-water apparatus, it is not intended minutely to describe the proper furnace for each different form of boiler; but the plan of building the furnaces for three or four different forms of boilers will be given, and the application of the principles to other forms must be left to the discretion of those who erect them.

The rate of combustion of the fuel in a furnace depends very little upon the total size of the furnace, but chiefly on the proportionate size of the furnace bars. A furnace which possesses, for instance, an area of 12 square feet, would not necessarily burn a much larger quantity of fuel per hour than one that had only an area of eight square feet; provided the area of the furnace bars was the same in both cases, and that no more air was admitted to the former than to the latter. But, by building the furnace of considerable dimensions, and with a moderately small area of fire bars, the fuel can be made to burn for a much longer period, without attention or renewal; and this is a very important object for this description of apparatus. For, as so intense a fire is not required, as is the case with a steam boiler, an extremely small degree of attention is necessary for a furnace of this kind, which, when well constructed, ought to burn for ten or twelve hours without replenishing the fuel.

In all cases, a good and perfectly tight furnace door is requisite; for, if the door does not fit accurately, a large quantity of cold air enters, and passes between the fuel and the bottom of the boiler, and cools the boiler to a considerable extent. The furnace-door should always be double; and also a door to the ash-pit should be used, in order to shut off the excess of air when the fire is required to burn slowly for a great length of time. Immediately within the furnace door, there should be a dumb plate; and the larger this is the better, provided it does not project the furnace-bars too far back, so as to cause the most active part of the combustion to take place at the posterior part of the furnace, instead of immediately under the boiler. The use of a large dumb plate in front of the furnace-bars, is to allow the fuel to be gradually coked, by placing it first on this dumb plate, and then,

when well heated, pushing it forward upon the furnace-bars, where it enters into active combustion, and then a fresh charge of fuel is to be again laid on the dumb plate in order to undergo the same operation. By this plan of cooking the coals on the dumb plate, nearly all the smoke from the furnace may be consumed; by which a considerable saving of fuel will be effected, and a great nuisance prevented.

The size of the fire-grate, or furnace-bars, must be regulated by the quantity of pipe or other heating surface which the apparatus contains. The quantity of heat given off by a certain extent of iron pipe, or other heated surface, can be exactly ascertained, and will be shewn in the next chapter. From the data there given, we learn the quantity of coals required to be burned per hour, in order to maintain the required temperature. Having already given the extent of boiler surface required to heat a given quantity of pipe, it will be desirable now to show the area of the furnace-bars which will be required. It has already been stated, that the extent of boiler surface exposed to the fire, may with advantage be increased beyond the dimensions already given; and that economy of fuel will generally result from this increased surface. But the quantity of fuel that is burned ought not to be also increased in the same way, and therefore the size of the furnace bars, which alone regulates the quantity of fuel consumed, should be proportioned to the extent of the surface giving off heat to the building, rather than to the dimensions of the boiler.

With the average dimensions used for furnace bars, the spaces for the admission of air will generally vary from one-fourth to one-third of the total area of the space occupied by the furnace bars. In this case, one square foot of furnace bars will be sufficient to burn about 10 or 11 lbs. of coal per hour, under ordinary circumstances; and on this calculation the following Table has been constructed.

TABLE.

Area of Bars.	4-in. pipe.	3-in. pipe.	2-in. pipe.
75 square inches will supply	150	or 200	or 300 feet.
100     "     "     "	200	" 266	" 400 "
150     "     "     "	300	" 400	" 600 "
200     "     "     "	400	" 533	" 800 "
250     "     "     "	500	" 666	" 1000 "
300     "     "     "	600	" 800	" 1200 "
400     "     "     "	800	" 1066	" 1600 "
500     "     "     "	1000	" 1333	" 2000 "

Thus suppose there are 600 feet of pipe, four inches in diameter, in an apparatus; then the area of the bars should be 300 square inches; so that 14 inches in width and 22 inches in length will give the requisite quantity of surface. When it is required to obtain the greatest heat in the shortest time, the area of

the bars should be proportionably increased so that a larger fire may be produced; and, on the contrary, when the object is to obtain slow combustion of the fuel, and when the rapidity with which the apparatus becomes heated is of little or no consequence, then the area of the bars may be reduced. The best method, however, will generally be found in using a sufficiently large surface of fire bars for the maximum effect required; and to regulate the draught by means of an ash-pit door, and a damper in the chimney; by which means almost any required rate of combustion can be obtained, with any ordinary degree of care.

When the size of the furnace will allow of it, a dead plate should be placed beyond the bars at the back of the furnace, as well as in the front; but the very small size, both of the furnace and the boiler, for a hot-water apparatus, frequently renders this difficult or impossible to obtain. Where it can be done, it will be found advantageous to adopt it.

It is a matter of very great importance, that the heat should be confined within the furnace as much as possible, by contracting the farther end of it, at the part called the throat, so as to allow only for a small space for the smoke and inflamed gases to pass out. The neglect of this causes an enormous waste of fuel; for, in consequence of the shortness of the flues of these boilers, the heated gaseous matter passes too readily from the boiler, and escapes through the chimney at a very high temperature. The only entrance for the air should be through the bars of the grate, and the heated gaseous matter will then pass directly upwards to the bottom of the boiler, and should be there detained as long as possible by the contraction at the throat of the furnace; and if this part of the furnace be properly constructed (by not making the throat too near the crown of the boiler, and making it sufficiently small in proportion to the total quantity of gaseous matter required to pass through it), a reverberatory action of the flame and heated gases will take place, by which a far greater effect will be produced, than if too easy an exit were allowed into the flues and chimney.

The boiler, fig. 18, may be constructed as an illustration of this mode of constructing a furnace. The furnace bars should lie level with the bottom of the boiler. Two large fire-bricks, or Welsh lumps, are then to be so placed, at the further end of the boiler, that the only exit for the flame and smoke shall be through an opening (varying from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches, according to the size of the boiler,) left between these two bricks, exactly half-way between the crown of the arch and the level of the furnace bars. The flame must not be allowed to escape close

to the top of the arch; for in that case no reverberation will take place, and the flame and gases escape from the furnace too soon to produce their full effect on the arched surface of the boiler, which, it has been already shewn, is three times as effective as the flue surface. The flue, after passing the throat of the furnace, diverges to the right and the left, and passes along the sides and then over the top of the boiler before it finally escapes into the chimney.

The boiler, fig. 22 and 23, requires the same arrangement; but in this boiler the aperture for the escape of the flame and smoke is generally made a part of the boiler itself. The opening is also somewhat lower down towards the level of the furnace bars, and the boiler being circular, the flue generally winds round the boiler, instead of passing separately on the right hand and on the left. The boiler, fig. 21, may be set in the same kind of furnace; or if the two legs or protuberances at the bottom be very short and close together, the fire may be made to act upon the whole under side (the bars being fixed at some distance below), and the flame returned through a flue along the top.

The boiler, fig. 20, may be set in two different ways. When the inside tube is sufficiently large, it is best to place the fire inside this tube, the furnace bars being placed at about one-third the diameter of the tube from the bottom. In this case the action of the furnace becomes very similar to that already described for the boiler, fig. 18; except that the water-way is continued below as well as above the fire. The throat of the furnace must be contracted, as already described for fig. 18; but in the present case the flues must first pass directly under the boiler, and then pass over the sides and top.

When this boiler is very small, the fire must be made entirely below the boiler; and it is then best in an oval or flattened shape, both externally and in the tube. The flame, in this case, passes from the furnace below, first through the tube, and then returns over the top of the boiler, and from thence the heated gases escape into the chimney.

The boiler, fig. 24, as originally constructed, had no external flue. It was chiefly used for very small apparatus, and it possessed the advantage, when a very slow draught was used (somewhat similar to that of the Arnott's stoves) of holding sufficient fuel to allow of the fire burning for a long time without attention, which is generally difficult to accomplish with very small boilers. The ingenious inventor of this boiler (Mr. Rogers) still prefers this plan, though many new modifications of the boiler have been introduced. It is now sometimes used with an external flue, in which case it

becomes very similar in principle to the boiler, figs. 22 and 23, though less effective as to heating surface, as there is a less extent of surface exposed to the radiant heat. In the original form, without the external flue, the temperature is difficult to regulate: as the more the fuel burns away, the greater the heat becomes, in consequence of a large surface of the boiler being then exposed to the radiant heat; and also because the fuel burns quicker, in consequence of the air meeting less obstruction in passing through it. In this case the greatest heat is produced when about two-thirds of the fuel has burnt away. When the boiler, however, has an external flue, the best mode of setting, is to make the flue proceed from openings left at the bottom of the boiler, and leaving a free space for the flue, around the boiler, of about two inches, or thereabouts. The draught of air meeting less obstruction in passing along the grate-bars and thence upwards through the external flue, than by passing through the large body of fuel contained in the body of the boiler, the whole external surface becomes available for receiving heat from the fire, instead of being entirely useless, as in the other mode of setting; and of course the same sized boiler will by this arrangement heat a larger quantity of pipe. This boiler, however, will, under any form, expose less surface to the radiant heat of the fire than the boiler, fig. 22; for its external surface will scarcely exceed the flue surface of this latter boiler, in its power of absorbing heat; and this flue surface, we have already seen, only possesses one-third the absorbent power which those surfaces have, that are exposed to the direct action of the radiant heat. The fire of this boiler, however, is readily managed, and burns with but little attention.

In the boiler, fig. 26, there is necessarily a considerable waste of fuel, in consequence of the flame escaping immediately into the chimney without passing through any flues—this form of boiler not admitting of any kind of flues being used. The flame passes between the several pipes which form the boiler, and of course can only act upon their under side. If the draught be rapid, a partial vacuum must be formed on the upper side of the pipes, the flame passing in straight lines upwards; and, therefore, a loss of heat by radiation would take place from the upper sides of the pipes which form this boiler. The boiler, however, necessarily heats rapidly, as the consumption of fuel in the furnace, owing to the rapid draught, is very considerable.

The advantage of making the furnace to contain a large quantity of fuel has already been mentioned. But, independent of the



smaller degree of attention required, when sufficient fuel to last for many hours is supplied at once, it is found practically that great economy results from this plan; and from experiments made on this subject, with steam-engine furnaces, it appears that the increased consumption of fuel always bears a direct proportion to the frequency with which it is supplied to the furnace; and that (in the experiments in question,) the greatest economy resulted when the fuel was supplied only once a day. When this plan, however, is followed, the combustion is less intense than with more frequent firing; and, therefore, a larger boiler surface is always required in this case. Care also should be taken to prevent the ingress of an undue quantity of air, when the fuel burns away, and the furnace bars thus become unequally covered; for in this case, a large quantity of cold air will rush in and cool the boiler.

The rate of combustion materially depends also upon the thickness of fuel on the furnace bars, and its compact or its open state, as illustrated in the two cases of small coal and of large well burned coke. The quantity of air passing through the firegrate or bars must be very different in these two cases, as the combustion wholly depends upon the quantity of air admitted to the fuel; and unless a sufficient quantity of air be admitted, to convert the whole of the carbon into carbonic acid gas, it will escape in the form of carbonic oxide, and a loss of effect will thereby arise.

The greatest economy of fuel is produced when the fires are kept thin and bright; the coal well coked, by means of a large dumb plate in the front of the furnace, and the damper kept as close as possible, consistent with allowing a sufficient draught. The Cornish engines, so celebrated for their economy of fuel, are thus worked. The thinner the fire, the less is the probability of the formation of carbonic oxide, which always causes a loss of heat; and when thick fires are used, this loss is frequently very considerable, unless (as in Mr. Parkes's experiments already mentioned,) air is supplied above the fuel, as well as through the furnace bars. In the small furnace of a hot-water apparatus, it is frequently difficult, if not impossible, to adopt this plan of using a dumb plate sufficiently large to coke the whole of the fuel which is used; but the principal should be borne in mind in all cases, and applied as far as the circumstances will permit. The theory of combustion will be given in the chapter on the combustion of smoke. For the cuts referred to the volume, must be consulted.

#### THE DAHLIA FANCY.

By attending to our notices of seedlings, our readers will be able to judge pretty well of

how many, and which, flowers are best worth their notice on adding to their collections, but it is by repeated exhibitions of the same variety that we are enabled to do justice to a really good flower, and speak with certainty of its properties. The proofs of the flowers we described last year are gratifying; Lady Antrobus, Emma Noke, Sir J. Stuart Richardson, Standard of Perfection, Nonpareil, Aurantia, Lady St. Maur, and some others, have been proved over and over again, to have been accurately described; their characters were as nicely drawn as it was well possible to draw them; and we are now in a season which will decide the fate of scores which have been saved a second year for trial. If we are occasionally astonished at the apathy of some part of the trade with regard to the Dahlia, it is because, when conducted with prudence, this is the most profitable of all the branches, but like all other things, it may be, and has been, overdone. Those who entered upon it once, made money rapidly, and then, because to a certain extent it did well, they, as the Americans say, "went too much a-head;" and because they could propagate to any extent, they did too much, had many left on their hands, sold them to get rid of the roots, and literally spoiled the trade by supplying more than were demanded. This, and this alone, half sickened some of the nurserymen. The blight which came over the Dahlia trade, when the Metropolitan Society was suspended, made it ten times worse; and many who did a good business, and by moderate, instead of immoderate, propagation, might have kept it, have altogether declined. The blight, however, which affected the trade, has passed away. The revival of those shows which were the life and soul of prosperity, was a measure which could not fail to restore it; and the good taste which prevails as to the choice of a flower, will secure a much better race of varieties for general cultivation. The recognition of border flowers of the fancy kind, has created a new impulse; and we must say, that where flowers are grown for ornament, in clumps, borders, shrubberies, &c.; the bright bicolors give a wonderful relief among the rich selfs, which already grace most of the better kind of gardens. It will be seen by the names of the dealers who liberally support the Great Metropolitan Show, that the trade is getting into much fewer hands; and this concentration will enable people to procure all they can want in one parcel, from any one of the subscribers. Thus, instead of being troubled to order, and incur the expense of paying for, half-a-dozen baskets, which used greatly to enhance the price of a collection, one item of carriage will crown all. We were going to say a word or two in favour of the flowers as an orna-

ment to the garden ; but, it appears to us little short of an offence, to presume there are any who can under value it. From June till the frost cuts them off, a mass of flowers can be kept up by the *Dahlia*, which no other combination of plants can accomplish ; and where they are not seen, we suspect the idleness and the parsimony, as well condemn the want of taste, of both gardener and owner. That they do give trouble when grown in large numbers is true, but for the purpose of ornament they require very little care beyond fastening to good stakes ; showing is another concern ; the royal and noble breeders of sheep and cattle do not take the same trouble with the thousands upon the downs and in the pastures that they do with the two's and three's intended for the agricultural shows ; so also with the myriads of subjects which grace the flower-borders, beds, and clumps, they do not altogether cause so much trouble as the few intended for the shows. Those who do not show, but who wish to ornament their grounds, should order by colours and heights, expressly for borders. Some show flowers would make bad plants, and therefore, those who serve the *non exhibitors* should be careful to select those of beautiful habit. Suppose any one chose to order a collection of the leading colours ; lilac, light purple, dark purple, light pink, (or rose) ruby colour, dark crimson, white, yellow, orange, bright scarlet, blood-red, and black, here are twelve selfs, to these may be added a dozen fancy bicolored (or two coloured) flowers, of the bright and highly contrasted kinds ; not those delicately edged whites, which look at the least distance like white itself, but those of more decided character whereof the two colours are seen at a great distance, from the remarkable contrast they present to one another in the same bloom. In groups to fill up a clump, a beautiful effect may be given by planting the tallest in the centre, and the shorter ones nearer the front, while the most dwarf of all can be next the edge. We shall be as particular in giving a description of the remarkable border or bicolored varieties as we have with the show flowers only, that the leading object being colour, it will not be expected that we insist on the finest formed petals in flowers which are as now recognized of a new race, we must in this proceed as we do with other and more particular subjects, we must put up with the best we have of any colour or character until we can get better formed ones to beat them, and the first show that has been announced, in or near the metropolis for flowers of this description, was for the present season of 1844. Here there will at least be great novelty, and it will be as attractive to those who grow for their own garden only, as to those who grow them only as florists' flowers to be ex-

hibited. To the public generally who take only common interest in flowers as flowers, the production of *Dahlias* of scarlet and white, scarlet and yellow, purple and white, yellow and white, and almost black and white, will in the first instance be singular enough, but such will be the attraction both to English and foreigners, that we anticipate a vast concourse of visitors. Hitherto such flowers have been produced here and there, and as they were not recognized as show varieties, they were scarcely noticed by the regular trade. This exhibition has called them from all quarters, and those who grew plants for curiosity only, have been preparing for months to bring them for exhibition in collection. The orders which have been given have been immense, and henceforward no show of any importance will be held without there being a class provided for the two coloured fancy border flowers. To look back upon our descriptions of ten or a dozen seedlings of last year, we do not know an exception to the fact, that down to the greatest nicety, the descriptions have proved accurate, and before the present volume is closed, we shall give from the same pen we trust as accurate a description of all those which have appeared during the season of 1844. Meanwhile let nobody who has a garden, neglect the *Dahlia*, for it is decidedly the most showy, effective, and long-lived beauty of the borders. The only two flowers which have not been publicly proved are the *Essex Bride*, and *Leander*. We have the opportunity of saying, that they are quite as satisfactory as the rest ; and so far as we have yet seen, they are at the head of their class. The great number of orders, and the limited number of plants, which the owners could produce, rendered it impossible to serve one-fifth of the growers ; and the raisers having some confidence in their standing the test of comparison another season, determined upon keeping them in. Had it been otherwise, these would have completed a test of our opinion on eleven or twelve flowers which have proved to be exactly what we had predicted. No person could have purchased from the characters we gave, but must be satisfied, not that every plant in everybody's hands has bloomed as they could wish, for old and tried flowers will not do this, but the varieties have maintained their characters ; and we have no occasion to make apologies about being deceived with single blooms, nor to beg pardon of our readers for misleading them. We believe few writers who pretend to give opinions on florists' flowers can say one half as much. We hope to give before the close of this volume an accurate description of the novelties to come out in 1845.

## ARBORICULTURE.

BY JAS. GRIGOR, AUTHOR OF "THE EASTERN ARBORETUM."

EVERY one, with any pretensions to taste, admits that trees are grand objects, beautiful and useful. Indeed, so current is this feeling now, that it seems almost superfluous to allude to it. We have always taken a high view of trees, because we have seen so much effected by them. There is scarcely a locality too desolate and savage not to be improved by them; and there is no spot, however trim, where they contribute not a fresh grace.

First, then, as picturesque objects. Behold them budding! See what a stirring and overlaying of green on all hands, till the landscape has assumed its usual summer dress, completely involved in one verdant mantle; then autumn comes, and, with the instructive colouring peculiar to that time, closes the scene. The subject is dwelt upon at large by poets, and it engages the attention, more or less, of every one.

Trees are full of association. It is natural they should be, growing as they do with our growth. We find Royalty itself stooping to the work of planting, and the deed is ever after recorded. It is a noble deed, too—better than erecting piles of stone and brick. In the one we have inert matter; in the other, a fair and flourishing temple. Why should not trees be planted oftener over the graves of the illustrious? This also may be left for poets to discuss.

Next, and chief of all, is the importance of trees as forming an article of commerce, and as employed in the hands of the artificer. Our forests, those vast congregations of trees which cover whole tracts of country, have all to be harvested, some time or other, and employed in the multifarious ways in which timber is available. A great part of them will fall to the equipping of fleets: much of them will be applied in the building of our houses, and in other domestic purposes intimately connected with the comforts and conveniences of man.

No one, it will be said, denies all this; yet is it not practically denied? We meet, indeed, with many who are fond of planting, and who plant, and with others who are always admiring the grandeur and beauty of the forest tribes; but how many do we find concerning themselves about the nurture and after-management of these objects? Here is the anomaly. We dare not deny that many of the English gentry take a delight in watching the growth of their trees, and are careful to ascertain the best treatment they can be subjected to; yet what a diversity of practice is in operation at the present day? Take but an autumn's ride in the country, and you see a num-

ber of labourers as pruners, hanging on the wood-side, full of good intentions, consulting no law as they proceed, and guided solely by their own caprice. Probably, one man will tell you he is dressing the trees—the meaning of which is, that he is cutting off every branch the tree has, just in the same way that we often find poplar-trees by the road-side to have been treated; another fore-shortens them—that is, cuts the branches about a foot or so from the trunk, lest the wound occasioned by cutting them off close to the stem should not heal, and thus produce decay: whilst a third person, with some show of reason, is displacing only the big branches which in any way interfere with the supremacy of the leader.

Thinning of the trees is another point on which various opinions are afloat—some maintaining that it is necessary to have the tree exposed on all sides to the air and solar influence; whilst others recommend the planting of trees so close to each other as to make them prune themselves, or to induce decay amongst the lower branches by excluding the air.

Such is the state of Arboriculture in the present day. It will be the object of succeeding papers to promulgate new and correct views on this important and engaging subject, and to attempt to lay down some simple rules by which a better way may be introduced in treating the denizens of the forest. The subject is extensive; it is one we love beyond all others; and we trust we shall have ample opportunity not only of enforcing its claims upon all who have waste lands to plant, but of showing to those whose ideas of trees are confined chiefly to the arboretum, or as to their beauty in ornate gardening, that a new field of enjoyment may yet be opened in connection with them.

To those persons who consider pruning to be all and everything in foresting, we would just observe that in due time it shall have our earnest and undivided attention, reminding them that there is a class who are waiting to hear something of trees as an element in Landscape Gardening, and of their proper adaptation, in other respects, to certain situations. To those, again, who expect that we should at once enter upon the felling department, it may be observed that there are hundreds of proprietors who are consulting as to what they should plant, and when they should plant. With proper deference to all, it may be stated that it shall not be the least part of our duty to strive to induce many to plant who never planted before. Royalty has set the example,

and without indulging in any extravagant picture of the probable results of the illustrious precedent, we shall not be far wrong in dating from the present time a new era in the annals of planting.—*Gr.*

#### ANTERHINUM.

I FIND that no plant has contributed so steadily, or so much, to the rich effect of colour in my parterres and borders, throughout the whole of the present season (and we never had a gayer) as the Anterhinum or Snap-dragon, of which there are now so many handsome varieties. The large-flowered pencilled white, the pencilled yellow, and the carnation varieties are the best; then the double white, single blood crimson self, cream coloured, tall tricolor, and others. All these are handsome plants, grown even singly, but when humourously grouped, they produce a very rich effect. For instance, a circular or oval bed may have five or six different sorts planted in the centre, with a variety of verbenas round the sides, mingling finely together, and bound closely up to the snap-dragons which grow bushy, but do not ramble, if a few minutes attention is occasionally bestowed on them, tying two or three of the leading shoots to short sticks. But the great advantage attending their cultivation in our gardens, is the fact, that they may be made to flower from May till the frost unceremoniously cuts them off, blooming almost as vigorously as ever. The following treatment is the result of my experience.

Where they have not been grown, one plant of each sort obtained in spring, and turned out into the borders, will amply suffice to raise a good stock from for the succeeding year. Early in August, select a shady nook, where the soil is light, and suitable for cuttings to strike root. Dig in some rough sand, mark separate spaces for each sort, with its own bell-glass, and after watering the ground copiously, insert the cuttings (previously prepared) about an inch deep. Put on the glasses without again watering, but in very dry weather do so occasionally. When they begin to push, transplant into another part of the border, where they can have a good deal of shade from the sun, taking care not to disturb the young roots, and be not sparing of water. It is usual to shift the cuttings at once into the pots, where they are to remain during winter, but the border treatment is best, as it makes stronger plants for early spring bloom. A few, however, may be thus treated, placing three cuttings in a middle sized pot, filled with almost any kind of soil that is not rich. Plant these round the sides of the pot, and by check-

ing their progress a little, they will fall behind those in the border, and come in for a three weeks late bloom.

About the middle of September, take up the young plants from the border (which must not be permitted to show any blooms), and pot them singly in good stuff, letting them remain under a sheltered wall, or other convenient locality, until the frost sets in, when all the protection required is a cold frame, and to have all the air possible in open weather. Early in April, a little top dressing is well bestowed, and by the time it is safe to turn them out into the border, the flower buds will be showing themselves. They continue several weeks covered with showy blossoms; after which, cut off all the flower stems just below the first seed pods, and in a short time a multitude of laterals will show bloom, and soon be a mass of the gayest flowers. The pencilled yellow is the most showy of all the sorts, and especially adapted for this treatment: this season my plants have bloomed four times most prolifically, as well as greatly increased in size.

The cuttings which, in September or October, were planted three in a pot, should be shifted during mild weather, in April, into single pots, using a stimulating soil, and they will be in fine order to turn out a few weeks after the others. When the first set are going out of flower, the second will take their place, and so on, throughout the season, if care is taken to cut off that portion of the old flower stems which has the seed vessels just formed. If these are allowed to increase, the plant receives a check.

Fine plants are also obtained by striking cuttings in a slight hotbed, or pit, early in spring. These make very compact autumn plants, and produce large, fine flowers. The snap-dragon is also treated like an annual, but in that case, the colours are never well mixed, nor the plants of any size till late in the season. It is better to sow the seed in September, and prick out the plants the end of April. The seed of the carnation sort produces a rich blood coloured self *only*, but the pencilled yellow often comes true, and always produces fine light coloured flowers.

*Durham.*

“PERSONNE.”

#### LILIES.

It is not generally known (especially among amateurs) that some of the most beautiful Lilies, usually met with in the greenhouse, not only thrive well, and flower luxuriantly in the open border, but are also quite hardy *in soils not retentive of moisture during winter*. This season I have *L. Erinneum* and *L. Japonicum* in perfection, planted out in 1842, where they

have remained since, *without any protection during winter*. Both have sent up numerous flower stems, each producing three, four, and even six blooms, of a magnificent size, and exceedingly durable; the flowers continuing in fine order above ten days, apparently not much injured either by the sun or rain; there have been a succession of flowers upwards of four weeks. I recommend the first experiment to be made with plants purchased from nurserymen in May, which are then to be turned out of the pots into the border, without disturbing the roots, having previously, with a trowel, worked in a couple of hands full of broken brick or tile at the bottom of the hole formed to receive the ball. If the bulbs are small, and water is not liberally bestowed on those of a large size, the first year, they will probably not flower; but I find they require no attention whatever afterwards. Last year I planted the bulbs the first week in October, in small pots, which remained in a cold frame throughout the winter, giving little or no water. The soil, turfy bog earth (not wet peat) and sand. The top of the bulb should just be discernible above the soil, and never without until the growth becomes stimulated in spring. A liberal drainage of the pots is, of course, indispensable. If the plants turned out in spring stand the first winter, there is encouragement to make further experiments. During frost, or, indeed, throughout the winter months, protection to some extent might be afforded by a thick sod, or an inverted flower pot, filled with saw-dust.

Durham.

“PERSONNE.”

#### GUANO USED IN HORTICULTURE.

HUNDREDS of columns in newspapers have been written to puzzle us upon the subject of this important article, and one paper, pretty nearly devoted to it, has, in a comparatively short time, contained numerous articles, so contradictory to each other, that we rejoice in the appearance of a small pamphlet, by Mr. Clarke, calculated to open our eyes to the real merits of Guano as a manure, and make us better acquainted with the source of the best, and the comparative value of the different kinds. From this pamphlet we have made some selections, illustrative of its application to horticultural purposes.

In the management of the Kitchen, Fruit, and Flower Gardens, Guano is producing wonderful changes, not only considerably increasing the produce, in some cases even doubling it, but bringing forward both vegetables and fruit, at a much earlier period in the season. To florists, the discovery of Guano has rendered their husbandry doubly in-

teresting, by furnishing a manure so highly concentrated, inoffensive, and so simple in its application, that they may with pleasure and comfort, mete out to every plant and flower its due portion of nourishment, and thus by their own hands impart a verdure, luxuriance, and beauty, unattainable by any other agency.

For vegetables, Guano should be applied, either in the compost or liquid state, at the rate of 4 cwt. to 6 cwt. per imperial acre. But perhaps it will be found more efficacious to apply half that quantity in the compost state, covering it well in the soil, and the other half in a liquid state, by way of top-dressing, during the growth of the plants. As many plots of ground used for rearing vegetables are of small extent, it may be convenient to remember, that two ounces of Guano applied to one square yard, is equivalent to 5 cwt., per imperial acre.

Mr. W. Skirving of Walton Nursery, in a letter to Mr. Myers of Liverpool, on the adaptation of Guano to market gardening, remarks:—

“I continue to use Guano to crops of all kinds, on my farm or garden, and in my nursery-ground; and in a liquid state I have used it in my hot-houses and green-houses, to plants of every kind, with great benefit to all. In market-gardens, and kitchen-gardens of any kind, I consider Guano invaluable, for by proper application of the liquid in the spring months, you not only double the quantity of many crops, but with such as rhubarb, sea-kale, asparagus, &c., you get them much earlier, which is a double advantage. In short, in all the departments of my business, whether the farm or nursery, Guano seems now indispensable. Whenever we see a crop not thriving, we apply Guano, the first wet day afterwards, and if the crop is not too far advanced, it generally has a very good effect. Manure is the mainspring in all farming or gardening operations: without plenty of it our labour is in vain. We may drain well, sub-soil, plough, or dig deep; but without abundance of manure, land can no more be profitably worked, than a horse can that is half-fed.”

For fruit trees, the late General Beatson suggests the following method of applying Guano:—

“I would recommend to those who may try it on fruit trees, to begin with not more than three-quarters of a pint to each tree, and to trench it about a foot deep all round the roots. If the first application be found insufficient, a second or third may be given at intervals of two or three months; or a better mode, perhaps of determining the quantity of Guano proper for each fruit tree, would be to select about a dozen trees of the same kind and size,

and to vary the quantities by an easy progression from three-quarters of a pint, to one or two quarts or more to each tree."

*Plants and Flowers.*—On the treatment of these with Guano, the following extracts from Hovey's Magazine will furnish explicit directions. By these experiments it will be seen that several failures have occurred from an excessive or injudicious use of the manure. It is therefore particularly urged that when the dry Guano is used in potting, the lumps should be thoroughly pulverized and mixed with the earth in which the plant is to be potted. When repotting is inconvenient, let the pulverized Guano be carefully stirred in with the earth in the pot, say to the depth of one or two inches. "The subsequent application of the Guano in a liquid state, mixed with water, at the rate of half an oz. per gallon, is sufficiently simple."

Mr. T. E. Teschemacher addressing the Horticultural Society of Massachusetts, stated:

"In the following experiments, I will first observe, that all those plants which were treated with Guano, were potted in a mixture, consisting of plain earth without any manure, sand, and a little leaf-mould, and peat, with which the Guano was mixed; that those plants which are compared with them, have been grown in the richest compost, and that both have had the same attention, and been grown otherwise under the same circumstances. *Fuchsia fulgens*: one year seedling, potted 17th of June, when two and a-half inches high, with one tea-spoonful of Guano; re-potted 9th of August, then twelve inches high, with another spoonful of Guano, is now a foot and a-half high. The contrast between this and the two-year old plant is very striking, both as to luxuriance of growth and colour of the foliage, the plant with Guano being vastly superior. I think also that the colour of the flowers is improved; it is well known among gardeners that it is rather difficult to grow this plant well. *Pelargoniums*,—two seedlings grown with Guano, and one of the same sowing without; on the 17th of June, the two former were potted with one tea-spoonful of Guano, and re-potted on the 9th of August, with another tea-spoonful; here also the difference in favour of Guano is very great. *China roses*—two cuttings, potted 17th of June, each with one tea-spoonful of Guano; one was then seven inches high, the other four and a half. They are now thirty-four and twenty-eight inches high respectively, with large healthy foliage and stems; these have not received a second application of Guano. *Celosia cristata*, or *cock's-comb*—one seedling, with one tea-spoonful and one of the same sowing without; the size of the stem, foliage, and head of that with Guano is more than

double that of the other, and the difference in the colour of the leaves is remarkable. *Salvia patens*, with one tea-spoonful of Guano—the effect here has been to lengthen the joints, and the flower appears smaller than usual. *Acacia Farnesiana*—a seedling showing the size of the foliage and length of the joints previous to the application of a tea-spoonful of Guano, and the remarkable growth of both afterwards. A *Camellia* with two tea-spoonfuls—this specimen which was quite small and unhealthy before the addition of Guano, as may be seen by the lower leaves, exhibits in a most marked manner, by its beautiful large deep green leaves and healthy bud the action of this manure. On a *Camellia* grown with a large proportion of fine wood charcoal, the foliage and buds are extremely fine and luxuriant, and of a healthy green colour, but not at all equal to that treated with Guano. One *Balsam*, two tea-spoonfuls; re-potted 9th of August with two more, to which a little lime was added. This is an ugly specimen, which confirms an observation in the *Gardeners' Chronicle*, that balsams manured with Guano produced smaller flowers. I have watched it carefully, and found that not a single flower missed bearing its seed-vessel, and that every seed-vessel I have opened contains from fourteen to twenty perfect seeds. From what I have seen of Guano, it is clear that its action is rapid and powerful on the stem and foliage, increasing their size and deepening their green colour; of this fact there can be no doubt. I think it probable that it diminishes the size of the flower in some cases, and that it improves the seed both in quantity and quality; of this, however, more experiments are required to prove the certainty. When those plants were re-potted, which received a second application, the roots were very numerous, and appeared in the most vigorous health—thick, succulent, pure white, the tips with that hairy appearance so well known to cultivators as a sign of strong growth. In Peru, it is customary, when using Guano to raise pepper, to manure three times; first, on the appearance of roots, then on the appearance of the leaves; and, lastly, on the formation of the fruit. I think the experiment of its action on all fruits, particularly the the larger fruit trees, as apples, pears, peaches, &c., will be extremely interesting, as well as on the vine, which is well-known to be excessively greedy for rich food, particularly for bone manure, the chief ingredient of which, phosphate of lime, Guano contains in considerable quantity."

Mr. Teschemacher then proceeded to show that Guano contained in large proportions, the ingredients necessary for the growth of plants in general, and for the maturation of seeds:—

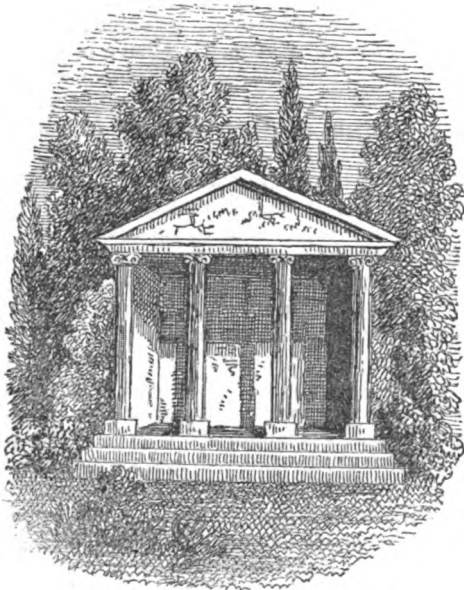
"The nectariferous juices, or, as they are commonly called, the honey in flowers, are usually separated or secreted by glandular bodies called nectaries, and this honey has by many been supposed indispensable in the fecundation of the seed; but there are also glands on the leaves and leaf-stalks (petioles) of many plants, which perform the same office of secreting honey; here, of course it cannot be of use for this purpose. Such glands exist on the petioles or leaf-stalks of most of the *acaci* tribe; on the tips of three or four of the lower serratures on the leaves of *Grewia*, on various parts of the leaves or stems of the *balsam*, on *passiflora*, and many other plants. These glands only secrete honey during the youth and growth of the leaf; it is then only that their operation and beautiful structure can be properly observed. When the leaf has attained its full growth and perfection, the active part of these glands dries up, the time for observing their powers is past, and the leaf then proceeds in its own important functions of elaborating the sap. It has been lately surmised, and it appears to me, with every probability of truth, that this honey is an excretion of the superabundant and useless part of the juices thrown off, after the leaf or flower has selected all that is necessary precisely analogous to the excretions of the animal frame. I will attempt very briefly to show, that this view, if correct, is of some importance, both to agriculture and horticulture. Mr. A. A. Hayes of Boxbury, in a beautiful, simple, and, I believe, original experiment, before the Chemical Society of Boston, proved the existence of phosphoric acid (probably combined in several seeds), by immersing sections of them in weak solutions of sulphate or acetate of copper; in whatever part of the seed phosphoric acid existed, on that part was deposited a precipitate of phosphate of copper; this was particularly evident in the seeds of India corn. A certain quantity of phosphoric acid, or phosphates, is therefore necessary to the existence of these seeds; and that part of the plant (probably the flower) destined to perform the functions of preparing the juices for these seeds, must go on exerting its utmost powers in selecting and rejecting, until the requisite quantity of phosphates and other ingredients for the seed are obtained. Now the phosphates in most soils exist in extremely minute quantities; therefore, those plants and flowers whose seeds require them, must extract large portions of food from the soil before they can select the amount of phosphate necessary for the perfections of their seed; and probably, only as many seeds arrive at maturity as the plant can procure phosphates to complete; the remainder, embryos of which are always

formed in abundance, are abortive—that is, never come to perfection. The same line of reasoning, of course, applies to the other necessary ingredients of seeds. If, therefore, we present to a plant food containing an abundant supply of these ingredients, it seems reasonable to suppose, that we shall produce more seeds, or rather that more of the embryo seeds will be perfected. Now, *the chemical analysis of Guano, shows that it contains, in abundance, most of the necessary ingredients of plants and seeds, the nitrogen of its ammonia being absolutely requisite for the cellular, vascular, and other parts of the stem and leaves, and its phosphoric acid, as well as its nitrogen, for the seeds; and if future experience should confirm what I have thus stated as an opinion, that the flowers of plants manured with Guano become smaller, it may be accounted for on the assumption, that as there are presented to the plant these ingredients in abundance, particularly those necessary for the seed, the flower and its glands, whose office it is to prepare the latter, have less work to perform, less food to analyze, less to select, and less to reject; hence, there is no necessity to have them of so large a size as where much exertion of these functions is required. The seed will also be larger and in greater quantity."*

"We shall forbear to enter on the chemical analysis of Guano; it is more our province to show its effects, and to inform our readers how it may be most efficiently employed in horticulture. We have in progress various experiments to assist in proving its value; and, as far as these have gone, they have in general been most satisfactory. We have already proved that it may be used too freely, and that injury may be thereby produced. In a liquid state (four ounces to a gallon of water), applied twice a week for three weeks, to beds of strawberries, it has occasioned an amazing growth of foliage and blossoms, but its influence on the crop of fruit remains to be seen. On the other hand, a bed of seedling Alpine strawberry plants, which had been up about a month, was thinly sprinkled with unmixed Guano in powder, and it destroyed every plant where it was applied. The half of a bed of onions, which were six inches high, was sprinkled over a month ago with pure Guano, at the rate of two ounces to every square yard, being upwards of five cwt. to the acre; the season has been rainy, and the Onions treated with Guano are double the size of those not so treated. Potatoes, which were six inches high, had Guano sprinkled along the rows, amongst their stems, at the rate of an ounce and a half to every yard; and these are now (five weeks subsequently) far superior to those in parts of the rows purposely left without

**Guano.** Nine parts of light soil were mixed with one of Guano, and half a spadeful of the compost was put into each of the holes regularly made to receive it, in a prepared bed of light soil; in the midst of the compost in each hole, a plant of Brussels sprouts was put, and then well watered. This was done a month ago, and at the present time more than half the plants have dwindled and died. Geraniums were watered at intervals of a week, five times only in the whole, with Guano water, four ounces to the gallon of water; their leaves began to curl, and, although the use of the liquid Guano had been discontinued two months, it is unlikely that the plants will recover till they are potted in fresh soil. Plants of various sorts, in pots, watered only with Guano water, half an ounce to a gallon, have flourished astonishingly—none have failed. These are lessons which cannot be mistaken.”—*Hovey's Magazine*.

This pamphlet cannot be too liberally distributed among the farmers and gardeners of Great Britain; and we shall endeavour to persuade our readers, that all they have been spelling in the newspapers may be thrown aside as useless, while they have this pamphlet at hand. The contents are reconcilable with common sense. There is not one sentence contradicting another; and among the alleged experiments there is much to learn that will be really useful.



### GLENNY'S GARDEN PRACTICE.

#### GENERAL REMARKS.

The chief operations for October were given

this time last year, and a few remarks will now be made on more general topics. This commences the season for all kinds of alterations, and for the planting of trees and shrubs; for as soon as the leaf falls, all deciduous plants, may be safely removed. A garden always admits of improvement; however perfect it might seem, there may be something done to make it better; and however the changes and planting may be delayed, it can never be done better than at first. If the weather be dry and favourable for working the ground, you should always act as if there was just time to complete before bad weather sets in. I have seen operations neglected at first, because there were six months to do them in, and autumn work left till the spring, until the weather set in wet and swampy, alternating with hard frost, so as to delay the work, much against the operator's will, until it was too late for planting with good effect, and nothing was done properly. There are many things to be thought of at this period; there is the purchase of all the bulbs required for beds, borders, and potting, as well as for glasses, and though the bulb market may be glutted one week, the best may be taken away the next, so that it is above all things desirable to make the selections of these subjects early. The cheap rate at which they may be purchased ought to make them general favourites in gardens, because few things will stand more hard weather or look more beautiful in flower, or afford a more grateful perfume than the hyacinth and narcissus. Those who take any pride in a gay spring garden, ought especially to look to crocuses and early tulips in addition to the bulbs already mentioned, for they perform their part admirably; and there is a great advantage in the room they make for other subjects when their bulbs are taken up, which they should be as soon as the leaves decay. The fritillarias or crown imperials are gay, and deserve a place in wide borders and all large concerns. The bulb of those are to be had at any seed shops. Hardy cyclamens will do pretty near the edges, and hepaticas, polyanthuses, the better kind of primroses, pansies, and all these dwarf subjects play important parts in the early spring. There is no plant more beautiful in its season than the hepatica: the colours, red, white, and blue, form a pleasing variety; the bloom comes almost through the snow, it is very prolific, and when they have stood a season or two they spread and become for their blooming time the principal and most brilliant ornament of the border. Hollyhocks, long improperly neglected as a border flower, have been so wonderfully improved by culture within the last few years that no garden should be



without its collection; they are no substitute for the Dahlia, nor is the Dahlia any rival to the hollyhock. Whoever could suppose that the appearance of the dahlia formed the least excuse for neglecting the hollyhock, must have been very silly, they might just as well consider that the poplar superseded the oak, or the oak the poplar. About twenty-four colours or shades of the hollyhock, and all double, may be had of most florists, and as an ornament at the backs of borders or centres of clumps, they having a pleasing effect. Now is the time to look after these things, and it is always wise to leave nothing till to-morrow that can be well done to-day. It is one of the commonest things in the world for gardeners, I mean amateur gardeners, to find when a season comes round, that they have forgotten something that would have added greatly to the effect or the use of their gardens. In the spring after they fancy they have done every thing necessary, they find they have forgotten some common and easily procured subject that they cannot then produce in perfection. There is nothing more essential to the early flower-border than the wallflower; it is a bright yellow or orange colour, or mottled; while blues, whites, and reds predominate in all the principal subjects in bloom. The anemone, hyacinth, hepaticas, abound in all colours but yellow. The crocus has its bright yellow, it is true, but there are blues and whites to balance against them. The wallflower is rich in perfume, handsome in habit when planted out in autumn, when it is to bloom in spring, with plenty of room, and forms a pretty object. How few people, however, pay attention to the flowers of spring? How many gardens are never "done up," as the owners call it, until all the early beauties are departed? How often do we see the crocus peeping where nothing else in character can be seen? or the solitary polyanthus or primrose putting forth its flowers as a reproach to the owner that it is alone? Rest assured that the good gardener is always working for the future. In October he is providing for the beginning of the year as well as for half way through it; and it is impossible to be too much on the alert in making memorandums each month of the things in flower which you desire to possess in your own garden, and this month you may procure anything. In making alterations in grounds, if there be room at all, fix upon some place for a summer-house, not a mere structure of laths and oil cloth, but a substantial ornament. These things are not so costly as many imagine; something after the fashion of the annexed sketch would be an ornament worth notice, and, except the front,

requires no more expense than a plain and ugly patch of wood work. Pillars and fascia may be found at many builders' yards, and may be had cheap enough, and the fine effect of such a front is far beyond any thing we can describe. The planting of trees around it and at the back, would, of course, be a matter of taste. Near such summer-houses there should be many flowers, and especially of the kinds which are richly perfumed. Broad walks should be so turned as to pass close to it, otherwise a circular walk should be made to go from the main one, and turn in again. Among other subjects to be looked after this month, there should be the fruit trees, and shrubs required for planting. In this, as in all other matters, there is no time like the present. If you grow a collection of dahlias, you should endeavour to buy dry roots or pot roots of every one you require; they will cost you less, and be better than you can get in the spring. In short, everything you want for a garden should be diligently sought now; and every week it is delayed the choice is lessened, and the chance of being disappointed altogether is increased.

#### OBSERVATIONS ON THE CULTIVATION OF ROSES IN POTS.

By Messrs. Paul and Sons, Cheshunt.

WE have frequently observed that there are many ways of growing a thing, and all of them may be right under some circumstances. Our readers cannot fail to have noticed in an earlier part of this work, a very ample treatise on the Cultivation of Roses in Pots, from the pen of a practical florist, who had evidently succeeded well in pot culture, and who merely transmitted to us the particulars of his practice. At this time, hundreds are cultivating Roses in Pots after the manner there laid down. Messrs. Paul and Sons, though long after us in the field, have been successfully accomplishing the same object, and have just published a neat little pamphlet, containing the particulars of their practice. In a matter like this, as our own work has had the floral world to itself so long, it might have been expected we should be silent; but we give some extracts from Messrs. Paul's work for several reasons; first—our work should contain everything new, that is also good; secondly—whatever is not new, but merely a copy of the ideas already published, may at least be said to confirm the accuracy of our own treatise; and lastly—that our readers may for themselves judge of the merits of the work by the portions we extract. We have before observed, that Messrs. Paul's practice is

extensive; they have been the most constant exhibitors of the season, and Rose growers may read all they have written with advantage. They begin by saying:—

The Rose has long been a favourite flower, not only in England, but throughout Europe generally; and there is, perhaps, none other that has ever received such unlimited attention. The ardour manifested of late years in the cultivation of this flower has produced rapid improvements. Many varieties, which, for years past, have been held in high estimation, are now falling aside before the constant introduction of new varieties, which have materially widened the range of this beautiful genus, as well as improved the individual varieties of which it is composed. It is not, however, the design here to treat of Roses generally, but of their cultivation in pots; and this in as brief a manner as the explication of the subject will allow. This system of cultivation has created some stir among lovers of Roses; and from the decided superiority of the specimens exhibited at the various horticultural exhibitions during the present year, over those of the preceding, it would appear that Roses are well adapted for pot-plants, and are likely to engage the attention of numerous plant cultivators. The author would just remark that the following observations have been noted down at different times as they have occurred to him, and often somewhat hastily: and in sending forth this pamphlet he does not pretend to instruct his professional brethren, but merely to furnish what he considers a *desideratum* to those private amateurs who may wish for more particular information.

**APTITUDE OF ROSES FOR POT CULTURE.**—To the Horticultural Society of London are we indebted for first bringing this subject into notice; and, upon reflection, it appears somewhat remarkable that the idea of growing Roses in pots should not have been earlier adopted. A more magnificent genus of plants, possessed of such a combination of rare qualities, scarcely to be met with in any other, and one with regard to which the cultivator has so great a scope to exercise his skill and taste, could not be desired. If a continual succession of flowers be an estimable character of plants intended to be grown in pots, the Rose has a decided claim to our attention: if variety of colour—from white to yellow, red, or purple, with various intermediate shades—be sought for, it is found here; if scent be valued, the Provence, Perpetual, Tea-scented, and other classes, establish a claim on this point also. Their foliage, too, and general appearance is elegant; and in fine, from the flexible nature of the young shoots, they admit of be-

ing fashioned into any form the fancy of the cultivator may suggest.

**Duration of Bloom.**—An argument that has been advanced, to prove Roses are not well-suited for growing in pots, and can never become first-rate exhibition plants, is, that the flowers fall so soon after expanding. This must be, in part, allowed: but it must also be remembered, that this is not the case with all varieties, and the Autumnals are almost continually in bloom; for as the first flowers drop away, others open around them, and many kinds may thus be kept in bloom, out of doors, from May till Nov.; and if we include in-door culture, by forcing in winter and protecting in autumn, we may have Roses in bloom nearly the whole year round. But it may appear that this continual flowering of the Autumnals will eventually exhaust the plants, and cause the flowers produced late in the season to be poor and thin, but these, though often smaller than the early ones, are frequently the finest formed; and by watering the plants occasionally with liquid manure, the disparity will be but trifling.

**Advantages of growing the tender kinds in pots.**—There are many advantages, when plants are grown in pots, of which we are not able to avail ourselves when they are growing in the open ground. With regard to the tender varieties of Roses, these are very great, if we only take into consideration the facilities afforded of protecting them from frost and heavy rains, by means of pits; and it is not surprising to find they thrive so much better under glass than when exposed to all the changes and severities of the weather. The hardy kinds, however, (except a few be introduced, by way of varying the colours to a greater degree,) certainly need not to be grown under glass; they merely require plunging; and an airy yet sheltered situation in the garden should be chosen.

**Suggestion for growing tea Roses near London.**—Hitherto the Chinese and Tea-scented Roses have not been grown with much success in the immediate neighbourhood of London, nor in the north of England, when planted in the open ground. It is notorious that no collection, however small, can be complete without some portion of these Roses; and it is the vexatious disappointment alone, attendant upon their constant failure, that could have caused their growth in certain localities to have been given up. Doubtless, in some instances, an impure atmosphere may have caused their failing; but I humbly submit, whether, if carefully examined, the soil and situation would not often propound the difficulty. The ease, then, with which we can remedy these disadvantages, when the plants are grown

in pots, leads me to propose their cultivation in this way to those with whom they have not hitherto succeeded; and there is good ground to believe they will succeed well in this manner, and especially if grown under glass. Except for forcing, cold pits are perhaps preferable to a house, where they should be kept close to the glass, and plenty of air given. They should have the advantage of dews and soft showers; the lights in summer being merely used to protect them from cold nights or rough weather, and, by help of mats or canvases, from a hot sun.

*Methods of Growth.*—Among Roses there are two distinct kinds of plants:—worked plants, comprising the budded and grafted ones; and such as are grown on their own roots. Both succeed well in pots: the former, perhaps, produce the finest flowers, but should be grown on very short stocks; the latter form large and handsome plants. The greater part of the plants should be grown to bloom in the natural season, from May till November: the others, as forced Roses, blooming from March to June, which will be more particularly alluded to hereafter.

*Transplanting and potting.*—Early in autumn, immediately after rain, is the most favourable time to remove both worked plants and others from the ground; and such as have grown moderately, with well-ripened wood, should be chosen. The sized pots best suited are Nos. 32, 24, 16, and 12, according to the size of the plant, and they should be well-drained. In potting, the soil should be pressed firmly in the pots, watering freely afterwards, through a fine rose, to settle the soil about their roots. The cultivation of the Autumnals on their own roots may be commenced at any season, as they are usually kept growing in pots. If purchased in spring, in 60-sized pots, they may be immediately shifted into 48's, then plunged and watered continually, as required. *Our aim being to get the plants strong, they should not be suffered to flower;* and we should endeavour, through the growing season, to bring them to form a few vigorous shoots, in preference to a greater number of weak ones. To accomplish this, it is advisable to rub out some of the buds when first pushing, but keeping in view the handsome formation of the plant. The plants may be shifted on through the season, and in the following spring we shall probably find them in 16 or 12-sized pots, preparing for a vigorous growth and bloom.

*Thinning out.*—When potting, all suckers should be cut out from the worked plants, and straggling shoots shortened back to within a few eyes. Where too thick, some of the shoots may be cut out entirely; from three to ten,

according to the age or growth of the plant, being, in most cases, sufficient. Thinning in summer, immediately after flowering, is very beneficial. The best ripened shoots should be left, and such as stand in the best position for the well forming of the plant. The shoots left may be shortened in November and March: some at both periods, to obtain an early and late bloom.

*Soil.*—The soil in which I have found them succeed well, and have generally used, is, two parts of fresh turfy loam, broken up, but not sifted, two parts manure (road gatherings laid by for a season, or the remains of a hot-bed, not too far decomposed,) and one part burnt earth. This compost should be thrown up in a heap in autumn, and turned two or three times during winter, and a little newly-slaked lime scattered throughout, to destroy worms and grubs. This is the soil used for the mass; but for the delicate varieties (Chinese, &c.) it may be improved by the addition of one part leaf mould, or well-pulverised manure.

*Protection.*—After potting, the plants taken from the ground should be removed to a cold pit, syringing and shading, if sunny weather, for a week or ten days. Here they soon from fresh fibrous roots, and scarcely feel their removal. It will be well if the tender varieties can be allowed to remain in the pit during winter, at which season they require scarcely any water; otherwise they should be removed to the north side of a wall or fence, and a thatch of fern, or beech boughs, with the leaves on, formed; or any other mode of protection that can be more readily devised, to secure the plants from rain and frost. Indeed, it is clearly evident that the rains of autumn as seriously injure the delicate-rooted Roses as the frost in winter; for during the mild winters of 1842-3, many of them died, which was doubtless owing to their receiving too much moisture in autumn, whereby the roots perished. Thus, then, the tender varieties may be protected from injury during winter, and the hardy ones may be removed from the pits about a month after being potted, and plunged at once in the open ground where intended to be grown and flowered.

*Pruning.*—About the middle of November pruning may be performed, in order to effect an early bloom. The plants having been thinned out previously, all that is now required is, the shortening in of the remaining shoots. It is a difficult matter to lay down any precise rules with regard to pruning; upon the judicious adaptation of which depends not only the well forming of the plant, but, in a great measure, the perfection of bloom also. In order to prune Roses with certainty of success, we ought to know the character of each plant

we are about to operate on; for Roses of the same class oftentimes require very different pruning. The best criterion we can offer is, perhaps, habit of growth. Among the Hybrid Chinese, the two favourite old Roses, *Brennus* and *Fulgens*, both vigorous growers, frequently occasion great disappointment, by not blooming. The failure will probably be found to arise from the method of pruning. *These Roses, and others of like habit, should be well thinned out, but the shoots that are left for flowering shortened but little.* Others of the same class (Hybrid Chinese), that are weak growers, may be shortened in close; such are *General Allard* and *Lady Stuart*, two beautiful and well-known Roses. There are also varieties of intermediate growth, which may be pruned in proportion. The classes, *Gallica*, *Provence*, and *Moss*, may be pruned closer than the Hybrid Chinese. The Autumnal Roses there is but little fear of pruning out of bloom; early or late, they are sure to flower. These, when grown on their own roots, should be cut down almost close to the ground, to induce them to throw up suckers from beneath, which will grow much stronger than shoots formed above ground, and flower beautifully through the summer and autumn. One point, too, should be borne in mind, that Roses, when grown in pots, may be pruned closer than when grown in the open garden. Last season I shortened back the shoots of the Autumnals, *Gallicas*, and *Provence*, to within from two to four eyes; and what with thinning and shortening, the plants looked very naked, and at first sight appeared to many to have been cut too much. But when considering that each of the remaining shoots would produce three or four, and that the plants were not in the open ground, but in pots, it was evident such was not the case; and this their after growth and flowering fully confirmed. Some of the Hybrid Chinese, and other strong growers, were pruned close in proportion, leaving from three to six eyes on a shoot; and though the plants were young, and consequently small, their blooming both as regards the size and the abundance of flowers, was all that could be wished.

*Removal of Tender Varieties.*—By the end of March, if room cannot be granted them in pits, or a greenhouse, the tender varieties may be brought from their hibernal residence, and plunged in an airy situation; and such as were left unpruned for late flowering should now be pruned. But if allowed to remain in the pits through spring, they will bloom much earlier, in greater perfection, and with finer foliage.

*Plunging.*—It is an excellent plan, in plunging, to place the pots so that the bottoms rest on an inverted seed-pan or flower-pot. This

secures a free drainage, prevents the roots growing through the bottom of the pot into the soil, and is an effectual barrier to the ingress of worms. The pots may be plunged level with the ground, and so far apart, that the plants may not touch each other when full grown. After plunging, it is beneficial to cover the surface lightly with stable manure.

*Watering.*—Water should be given abundantly through the growing and blooming season. Guano-water is an excellent manure for Roses in pots: it should, however, be used cautiously—an ounce to a gallon of water is sufficient. If the plants require watering oftener than once a week, pure water should be given at the intervening periods.

*Destruction of Caterpillars, Green Fly, &c.*—When the buds first break, and continually afterwards, the plants should be keenly sought over, to destroy the grub and caterpillar, some of which are mere threads in appearance, but which travel from shoot to shoot, eating out the growing points, and thereby destroying the bloom, and whose presence can scarcely be detected till the mischief is done. The green fly is often very annoying. The most effectual way of ridding ourselves of these pests appears to be by removing the plants to a greenhouse for the time, or enclosing them, as they stand in the beds, with a covering of wet garden mats placed double, or oiled canvass, and by fumigating with tobacco.

*Disbudding, &c.*—When the buds first push, if two or three break close together, the weakest, or those taking the least favourable direction, should be rubbed out. Such shoots as are inclined to grow rank, without blooming, should be stopped, or taken out, if not wanted to form the head, for they appropriate to themselves the sap which should be directed into the flower-branches; and, further, render the plants of uneven growth. When the flower-buds are forming imperfectly they should be nipped out; and the size of the early flowers may be increased, by removing, at an early stage, the small backward flower-buds.

*Suckers.*—Suckers from the stock should be looked after; and whether from the stem, or under ground, be invariably cut out. It will also be found beneficial to keep the surface of the soil constantly in a loose state.

*Tying up and Training.*—As the plants advance in growth, some will require sticks to support the flowers, and keep the shoots apart. But those which hold their flowers gracefully, and shew themselves well, are not, perhaps, improved by being drawn from their natural position of growth; but where the flowers do not shew themselves to advantage, or the shoots become much crowded, the dwarf standards may be improved in appearance, and

really benefitted, by drawing the lower shoots downwards towards the edge of the pot, where they may be fastened to a piece of bast or wire, made to pass beneath the rim: the upper shoots may then be drawn out to sticks; or a neat hoop fixed horizontally, about the centre of the head of the plant, admits of a very pretty method of arrangement. If the plant be large, two, or even three hoops may be requisite, to which the shoots should be drawn, inclined downwards, as they are, when growing, sure to rise sufficiently upwards. This—the circular method of training—is the most natural one; but for the sake of effect, when intended for exhibition, the plants are sometimes trained to a face, so that all the flowers may be seen from one point at the same time. This is, to use a familiar expression, certainly placing the best side towards London, and would doubtless be an excellent method, if we could always hide the back of the plant, and feel satisfied with growing half plants instead of whole ones.

*Shading.*—When the plants commence flowering, it will be necessary to shade them during the middle of the day; and the covering should be moveable, that they may have the advantage of slight rains and dews.

*Choice of Varieties.*—We will now proceed to enumerate such varieties as appear best calculated for growing in pots. To select varieties to meet the concurrence of all cultivators, is, I fear, a difficult task, if not impracticable; so much in flowers depending on taste, that probably no two persons, though equally well acquainted with Roses, would select the same kinds.

*Characteristics of Varieties suited for Pot Culture.*—In searching out the following, from an immense number of varieties which I have had constant opportunities of looking over while in bloom, I have endeavoured to hold in view the following points:—1. Elegance of habit, regarding both growth and flowering. 2. Contrast of colour. 3. Abundance of bloom. 4. Form, or individual outline of flower. 5. Duration of bloom. 6. Sweetness. Probably few given will have a claim on all these points: some combine them more intimately than others. The *habit* of a plant is always deserving of regard, and especially when intended to be grown in a pot. As a class of Roses, the Bourbons may perhaps be given as a standard of habit. In a collection, *contrast of colour* is of undoubted import; and some will probably be found selected on account of their distinctness, which otherwise would not have found place here. With regard to flowering, *many of our profuse blooming Roses are not the most double nor the finest in form*; but the magnificent appearance they present as pot plants, when viewed *en masse*, may perhaps be con-

sidered a sufficient plea for their insertion. These, however, may be distinguished throughout the list by an asterisk being prefixed. There are various styles of Roses, each good in its way. Two points, however—the *habit of the plant*, and the *form of the flower*,—should admit of universal application. By *duration of bloom*, allusion is more particularly made to the length of time the flowers continue in perfection when open, than to succession of flower. The *Smithii* (Yellow Noisette), for example, and, in fact, most thick-petalled Roses, hold their flowers in perfection for some days; whereas others fall almost as soon as expanded. Now, to obtain a number of flowers on one plant, in all the various stages of bloom, at a given time, is one great point the cultivator of Roses in pots, for exhibition, has to attend to. Therefore, both among summer and autumn Roses, such as are for some time in perfection as buds, and when expanded for some time in perfection as flowers, are certainly the most desirable.—*Scent*, which is an estimable property of a Rose, needs no comment.

*Classes preferred.*—The classes of Roses that can be practically recommended for growing in pots, are, Moss, Provence, Alba, Gallica, Hybrid, Perpetual, Hybrids of the Chinese and Bourbon, Noisette, Bourbon, Chinese, and Tea-scented. The Boursault, Ayrshire, and Sempervirens, are pretty, grown as climbers, but are not fitted for exhibition.

(S) *Moss.*—There are but few varieties of Moss Roses that can be recommended for pot-culture; still, these few, cast among the many, give a great degree of distinctness to a collection; and they certainly cannot be dispensed with anywhere:—Blush, blush pink.<sup>1</sup> *Belina*, rich crimson, shot with purple. *Cristata*, bright rose. *Du Luxembourg*,\* fine crimson purple. *Lancel*, bright rosy purple. *Prolific*, rose. *Unique*, pure white. *Veillards*, pale rose.

(S.) *Provence.*—This is an excellent class of Roses for growing in pots; and the old Cabbage Rose must be excluded. The whole of them are sweet—very sweet; and their pendulous growth gives them a very graceful appearance. The flowers are large, well formed, and, in shape, mostly globular:—*Anais Ségalas*, rosy lilac. *Angers*, fine bright rose. \**D'Abbeville*, cherry rose, vivid. *D'Avranches*, blush pink. *La Fiancée*, pale flesh. *Laura*, rosy lilac. *Pompon de Laqueue*, flesh.

<sup>1</sup> The prices of the varieties throughout may be obtained by consulting the Catalogue published annually in September, and transmissible gratis, per post, on application at the Nurseries, enclosing two Postage Stamps.

Queen of the Provence, blush lilac. Sylvain brilliant rose.

(S.) *Alba*.—It is here we find that beautiful style of Rose, the edges of which are white, with pink centre, in the greatest perfection. The flowers are not of the largest dimensions; but the fine shape and elegant arrangement of the petals more than compensate for the slight deficiency in size. The *Albas* are bold, but not rampant growers:—*Belle de Segur*, fine blush. *Blush Hip*, blush, rose centre. *Félicité Parmentier*, beautiful blush. *Henriette Campan*, light rosy purple. *La Séduisante*, pink, edges pale. *Princesse Lamballe*, pure white. *Sophie de Bavière*, clear light rose. *Sophie de Marcilly*, flesh, edges pale.

(S.) *Gallica*.—These are of first merit as show Roses: they are of compact growth, particular regularity of petal, and fine outline. There is also a great variety and richness of colour among them; and they are, for the most part, very fragrant:—*Adèle Prevost*, silvery blush, fine form. *Aurélie Lemaire*, pale rose. *Arthemise*, deep crimson purple. *Beauté Vive*, bright crimson. *Belle Satinée*, rosy pink. *Bizarre Marbrée*, rose, marbled with white. *Blanche Fleur*, fine flesh white. *Boula de Nanteuil*, brilliant crimson and purple. *Comte de Murinais*, purple, spotted with red. *Cynthia*, beautiful silvery blush. *D'Aguessan*, deep bright crimson. \**Duc de Bassano*, dark red, spotted with white, distinct. \**Duc de Trevis*, crimson purple. *Duchesse d'Abrantes*, pale rose. *Docteur Dielthem*, bright shaded rose. *Dumont d'Urville*, deep red, fine. *Enchantress*, pale rose. *Fleur d'Amour*, bright crimson changing to purple. *Grain d'Or*, crimson and purple shaded. *Grain d'Or*, bright rose, marbled with purple. *Grandissima*, bright purplish crimson, beautiful. *Jeanne d'Urfé*, crimson and lilac. *Julie d'Etanges*, pale rose. *Kean*, scarlet and crimson, fine. *Latone*, pale rose. *La Volupté*, bright deep rose. *Leo the Tenth*, large rose, blush edges. *Louis Philippe*, superb dark rose. *Melanie*, fine crimson. *Nero*, violet crimson, spotted. *Nouvelle Provins*, deep crimson purple. *Omphale*, rose, finely spotted. *Oracle du Siècle*, dark crimson, shaded with purple. *Pergolise*, fine crimson. *Pharericus*, beautiful deep rose. *Shakspeare*, rose, scarlet centre. *Surpassé tout*, cherry.

*Hybrid Perpetual*.—These Roses have become universal favourites, and deservedly so. Their foliage is grand, and the flowers of some kinds are finely shaped. The rapid influx of new varieties has increased and improved this class surprisingly within the last three or four years. They have hitherto run too much on one colour—crimson purple; but this is every season being remedied, and there doubtless will soon be as great a variety as in other

classes. Some of these will be given as *Pyramid Roses*, for which they are well suited, blooming fine both in summer and autumn. They are excellent forcing-roses, and very sweet:—*Aricie*, large rosy lilac. *Auberon*, beautiful rosy crimson. *Baronne Prevost*, large pale rose. *Clementine Duval*, rose and lilac. *Comte de Paris*, superb purple and crimson. *Coquette de Montmorency*, brilliant cherry. *Dr. Marjolin*, beautiful light red. *Duc d'Aumaule*, deep crimson. *General Merlin*, light rose, shaded. *Lady Alice Peel*, deep rose. *Lady Elphinstone*, rose blooming in clusters. *La Reine*, large lilac, satin-like, superb. *Marquise Boccella*, fine blush, very sweet. *Mrs. Eliot*, deep rosy lilac. *Princesse Hélène*, bright rosy purple. *Rivers*, red, sometimes carmine. *William Jesse*, large crimson, tinged with lilac. The *Damask Perpetuals* are fine Roses, but few of them appear adapted for pot culture.

*Damask Perpetual*.—*Du Roi*, or *Crimson*, bright crimson. *Josephine Antoinette*, clear blush.

(S) *Hybrids of the Chinese and Bourbon*.—Many of this class are profuse bloomers, and some perfect models in form. There are also to be found here some brilliant-coloured Roses. The *Hybrid Bourbons* are remarkable for their robust habit and bold foliage. Many of them form fine *Pyramid Roses* in pots:—*Belle de St. Cyr*, pretty bright rose. *Briseis*, fine rosy blush. *Camuzet Carné*, delicate peach, very distinct. *Coupe d'Amour*, bright rose. *Coupe d'Hébé*, beautiful deep pink. *General Allard*, full deep rose. *La Colombienne*, lilac rose, satin like. *Lady Stuart*, fine full blush. *Madeleine*, pale flesh, edged with crimson. *Marie de Nerœa*, light pink blush. *Velours Episcopal*, violet purple. *Triomphe de Guerian*, large blush, rose centre.

*Noisette*.—On account of blooming fine so late in the season, the *Noisettes* form a very valuable class of Roses. The most of them are better trained as climbers: in which way their large trusses of bloom produce a very pleasing effect. Under this method of growth, then, we shall class the most of them, but a few may be retained here:—*Aimée Vibert*, pure white. *Omette de Tolozan*, white, sometimes flesh. *La Victorieuse*, white, finely shaded with rose. *Le Pactole*, fine yellow. *Miss Glegg*, beautiful pure white. *Solfatara*, large sulphur. *Vitellina*, flesh, centre whitish yellow, tender.

We shall at some future opportunity give Messrs. Pauls' varieties of *Bourbon*, *Chinese*, and other Roses, which they recommend, and which will guide the purchasers in their selection: for the present, all we need say is, that the pamphlet, like our own treatise, ought to be in every body's hands.



THE ENGLISH OAK.

BY JAMES GRIGOR, AUTHOR OF THE EASTERN ARBORETUM.

THIS tree is in every respect entitled to our best consideration. It has a character of its own, presenting us with the picture of boldness and grandeur; and, in these respects, we are quite right in judging of the merits of every other individual of the sylvan tribe by the resemblance it may bear to the adopted standard. A true Oak, of mature years, in good soil, high yet outspreading and well ramified, is by far the noblest sight to be met with among the rural sights of our country; and, were it only for its Oaks, England would be always prized for its unrivalled trees. Luckily for us, the English taste for trees during by-gone generations has been fully equal to that of the present day; for, go where you may throughout the country, even in poor districts, where there has been little encouragement to plant, and you readily meet with tracts of prosperous woodland; and anon with the grand old ruins of such objects has had been, a century since, the pride of our demesnes.

The most remarkable trees in England are of the Oak; and were every county as well explored as Norfolk has been, and all the extraordinary specimens recorded, as has been done in the *Eastern Arboretum*, the relative merits of those interesting objects would be much better known, and their striking points contrasted with each other, so that those which are really pre-eminent could be easily referred to. For example, it is thought by some, that in many respects, an Oak tree standing in the borders of a plantation at Thorpe Market, in the County of Norfolk, excels all the known specimens in England; but whether it does so or not, it is impossible under present circumstances to decide. The tree in question is certainly one of the finest I ever saw; upright, lofty,

and embowering; characteristic of strength and majesty, and forming in every respect a beautiful specimen. No doubt, there are many of a like character, though not of the same size, scattered over all the counties of England.

Whether viewed as a picturesque object, or as a tree applicable to the greatest economical purposes, the Oak unquestionably ranks first among the denizens of the forest. I shall be excused, therefore, for entering at some length upon its rearing and after-management.

In the generality of seasons, the Oak ripens its acorns in the month of October, when they fall to the ground. They should in no case be gathered from the tree, as it is not only inconvenient to do so, but the probability is, that the seeds so collected will shrink and shrivel. They may be sown either in the autumn or spring; I recommend the former, for I have always found that a stronger and finer crop is to be had after an autumn sowing. The Oak being a tap-rooted plant, great attention should be paid to the soil in which the acorns are sown. It should be rich, friable, loose to the depth of eighteen inches, sheltered, and subject neither to drought nor damp. This, of course, cannot always be had, but I mention it as the ground in which Oak-growing is to be seen in perfection. After the soil has been finely raked, the beds may be marked off, four feet wide, with an alley between of fifteen inches. Into this alley the soil from the surface should be "cuffed off" with the back of a rake, to the depth of about one inch, and the acorns sown in the beds about one inch and a half apart from each other. After they have been pressed down with a roller, or the back of a spade, the soil which had been previously pushed off should be

drawn over them with the face of the rake, an operation which cannot be performed efficiently without considerable practice. The plants may remain in the seed bed for two years, when they are fit to be set out in lines; and after they have been two seasons in such lines, they should be finally planted out. When of this age, pits are invariably made for them, and the distance at which they are planted from each other is about six feet. The most important part of their management now to be attended to is the pruning, to which I am particularly anxious to direct the attention of every arborist, and all those who have the care of plantations. It is to be feared, that every species of pruning practised in the present day is absolutely hurtful to a tree. Experience teaches us that the system generally pursued is by no means necessary; nay, that in many instances, the practice is attended with the worst possible results. A tree is in itself complete, and it cannot be approached with the knife, as it is at present usually done, without offering violence to the delicate organization through which it has its being. It is a mistake to suppose that the tree of the wood, with its branchless and smooth stem, is the specimen nature delights to exhibit as her perfect work; for every one must see that such an object is in a great measure artificial. Her production—take the Oak for example—is quite a different thing; it rises out of the earth, as if the earth belonged to it, and it casts its head, wide and excursive, into the air, as if the whole air belonged to it; it is furnished with branches on all sides, robust and tortuous; and these are overlaid with an innumerable number of leaves: such is the perfect tree. Take but one leaf from it, and you do it an injury, for you thereby disturb the delicate part that leaf was fulfilling in the economy of the living structure.

The best system of pruning, then, is only a necessary evil. The stem may be fashioned for the carpenter or builder, but this cannot be done without weakening the agents which support the stem; so that what is gained in shape may be said to be lost in constitutional vigour. At some time, though this will be found to be correct in general, the removal of a branch by pruning is not all loss; for by removing one branch, the sap which would have been expended on that branch, may be directed into another and more serviceable channel. It is also to be remarked, that though the leaves of a tree are very much lessened by pruning, it often happens that this operation is performed without any real loss to the tree; for where the spray is thick, a branch may be cut out, and the loss compensated by the rays of the sun being thereby more beneficially directed to those parts which remain. Whichever view,

therefore, is taken of the subject, it is unquestionable that the forester has a most difficult and delicate operation to perform; and it is high time that this nice art should be taken out of the hands of ignorant practitioners.

One thing is certain, that if a tree is to be pruned, it should be done early. At the same time, I am unwilling to sanction any system of pruning whatever; and, so far as forest trees are concerned, should like to see the word expunged for a time from the English vocabulary. My maxim is a very concise one; and it is this—if the ultimate object be timber, *start all as timber trees*, not by cutting off all, or many of the side branches, for the body requires them, but by leaving them subservient to the central and leading shoot. Even this treatment ought to be restricted to a very limited time, for there can be nothing more detrimental to trees, than the continual worry and disarrangement they are subjected to under the present system, which extends to the end of their existence. If, on the other hand, trees are desired without reference to their timber (though it is believed it will in this case be often found superior to pruned timber), then no knife or pruning hook whatever should be allowed to come near them: nature will accomplish her own designs in them, and if we are to judge by the magnificent specimens she produces, without the interference of man, she will, as heretofore, work after a nobler fashion than he.

It is not to be doubted, that, amongst the labouring classes especially, the adoption of wholesale pruning principles takes its rise from a misconception of the chief and primary uses of trees. Many men see no beauty in a tree unless it be moulded to suit the artificer in wood; they cannot understand why the stem should be encumbered on all sides with a heavy load of brushwood, and hence there is a desire to clear it away—to “dress” it, and leave the trunk smooth and clean. To such, indeed, the “green tabernacles” have been spread out in vain; and it would be useless to attempt to convince them, that trees were originally planted on the earth for their beauty, their grandeur, their shelter, their shade, their fruit, or for any thing else, except their timber.

In fine, I cannot admit that a tree, taken as a perfectly organized object, can be in any way benefitted by having its branches cut off; so that, whoever prunes, should be well satisfied that the vacuum he leaves by cutting out a portion of the spray is operated upon by the air and solar influence, sufficiently to make up for the loss thus occasioned; or that he has in reality gained an equivalent in a better outline to the tree, or an increase of vigour in the



central stem. These remarks apply to every other tree as well as to the Oak; and having thus stated my views on the subject, it will not be necessary in subsequent papers to recapitulate them.

It is universally agreed upon, that the Oak wood is best when felled in winter, with the bark on, though, for the sake of the latter, the trees are sometimes stripped.

#### EXPERIMENTS IN HORTICULTURE.

THE manner in which some of our scientific bodies direct experiments to be tried, would soon bring science into contempt were the public press to do its duty by exposing the folly of it. The most simple, nay, the most out of the way silly experiment would never offend us, but nothing would in our mind be an excuse for trying experiments in a stupid way. Suppose for instance, without any possible motive that could be guessed at, we saw a man trying to grow one plant in sugar, another in salt, and a third in mustard; the thing would appear funny enough, but a man is not obliged to know that they would not grow. But if we saw a learned body doing or directing such things, we should complain that they ought to know better without trying. Again, if the object were to see the effect of particular sorts of dressing on particular sorts of plants, we should not complain of the most extraordinary applications in the world, so that they were not known to be destructive, but if we saw them trying the effect of dressing on single plants, which differ so amazingly under equal circumstances, we should set it down as a waste of time and money, and derogatory to the execution of a common Mechanics' Institute of the lowest grade. Experiments to be useful to science must be also rational. Plant out a piece of cabbage on ground all over alike, pay equal attention, and notwithstanding all are treated alike, there will be a wonderful difference in weight. A man then, who would try the effect of any thing on a single plant, for each kind of dressing, would be very properly set down for a fool. Again, plant out a lot of potatoes on ground alike all over, let each have the same space, let all be the same weight, and as nearly as possible the same in appearance, serve all alike, and when they are taken up some would bring double the weight of crop that others did. When this is the case, what would be said of a man who would try experiments on single tubers? He would be considered an ignorant, silly, person. The first duty then of the experimentalist is to secure as nearly as possible equal circumstances as a foundation. If a rational man wanted to

try the effect of any half score of sorts of dressing upon cabbages, he would say I must try each kind upon the same number of plants, and that number must be sufficient to form an average. If we suppose ten to be enough, and not more than enough, be it so, for the chances of any vast differences in tens must be greatly lessened, as compared with the difference in single ones. Experiments upon quantities which present a fair average are conclusive, while any made upon single plants must not under any circumstances be depended on, even for the most common results. Many curious discoveries have been made by accident. Witness a fact that may be familiar to many growers of carnations, the stakes which are pitched to preserve the part that goes in the soil from rotting, will be found so completely surrounded by the fibres of the roots at the end of the season that they could not be drawn out easily without dragging up the plants also, while the stakes not pitched will not be found to have a fibre near them, or at any rate attached to them. This accident suggests that pitch is agreeable to the plant, and that the quantity of pitch to put into the soil, whether in lumps or powder, are fair subjects of experiment; but would any man in his senses for practical purposes, try upon single plants? Would it not strike any thinking man that, whatever might be the result, it could not be depended on? The mode of application, as well as the quantity, may be tried with advantage, but it must be in a number not on single subjects. There has been a vulgar notion, that dung was injurious to tulips, and while some have carefully avoided the use of any soil with dung in it, others have actually put a very thick layer at the bottom of their beds, for the fibres to reach just as the blooms are perfecting themselves, and soon dispelled the notion of its injurious tendency among those who saw the plan. Others have made up their minds, that if a tulip bloom or bud were cut or broken off, the colour would be spoiled for the next season, but a few trials have dispelled this error also: where there is a practical evil suffered, every thing that could be imagined likely to get rid of it might be fairly tried, and records of the experiments which fail are quite as interesting and almost as useful as those which succeed. Many experiments are open, and called for almost, upon the subject of run carnations, but here the experiments on single plants would be madness; for when we see two layers off the same plant, wintered in the same pot, and bloomed in the same flowering pot, one clear and the other run, without our being able to detect the slightest difference from first to last in their treatment, it must convince everybody who

takes the trouble to enquire, that no single plant could by possibility form any evidence to be depended on, for whatever results might be produced. Whatever experiments are therefore tried, must be tried on rather an extensive scale to be depended on at all. G.

#### INJURIOUS INSECTS.—NO. V.

The Currant Hawk-fly (*Ægeria tipuliformis*.)

THE ravages which insects commit upon plants and fruits are frequently so extensive and deplorable, that it becomes a matter of very serious importance to attend to their habits more closely, and to endeavour to devise some means of checking their progress. Although, as yet, but few remedies have been discovered for preventing the attacks of only a very few species of insects, yet it is by no means improbable that, when more attention has been bestowed on the subject, means will be discovered to repel the ravages of numerous other species. It is not likely, however, that any such useful discoveries will be made unless the species and habits of the insects are well known by those who sustain injury from them, and who also have the best opportunities to make experiments for eluding or destroying them. Any hope of effectively destroying insects without being acquainted with the peculiar habits and instincts of the species, is as futile, as it would be for a man who is ignorant of the cunning and wary habits of a fox to attempt to entrap it. Impressed with this conviction, I here propose to make the hurtful habits of one of these insects more generally known, so that the gardener who may suffer from its attacks on currant and other fruit bushes shall be better able to contrive a defence against it.

Some years since, having noticed in a garden at Leytonstone that the currant-bushes would suddenly have their branches droop and wither, although previously looking in good condition and full of fruit, I drew the gardener's attention to the subject. As I could not concur in his explanation, which ascribed the mischief to a flash of lightning, I split several of the branches, which still retained their green and fresh appearance, and in each of them I found concealed a caterpillar of the currant hawk-fly (*Ægeria tipuliformis*). The caterpillar eats into the very pith of the branches, but, when about to change into a chrysalis, it makes its way towards the bark, which it gnaws until it has reduced it to a thin curtain, which serves to screen it a little while longer. When, however, the chrysalis is ready to burst its shell to disclose the perfect insect, it extends its body, and so thrusts open the

thin curtain of bark, and then the head being protruded, the shell splits, and allows of the escape of the perfect insect. The latter may be readily recognised, it being a handsome fly, possessing four wings covered with scales, or minute feathers, and a long feathery tuft at the extremity of its abdomen. When resting on a leaf or twig, it expands its wings horizontally, and spreads out its tuft. In size it is about half an inch long. It is easily captured while resting on the bush, and seldom flies far or much until towards the afternoon. As the caterpillar can seldom be discovered until it is too late to prevent its mischievous propensity, the best thing the gardener can do is to make a practice of destroying the flies; and this can easily be done, as they are generally so conspicuous and sluggish as to render them easily detected. But I have often remarked, that gardeners will destroy the ugly grubs and caterpillars without giving them any quarter, yet they show the most extraordinary mercy towards the pretty flies into which they are transformed. This is especially the case with regard to the present insect, which is readily seen by the gardener, but allowed to escape on account of its beauty. Yet the destruction of a few of these flies would be the most direct way of preventing some thousands of currants suffering from the attacks of the offspring of the eggs which they will otherwise deposit. In the instance of the currant-bushes at Leytonstone, a great quantity of fruit became shrivelled and spoiled in consequence of the grubs injuring the branches. I have seen several other instances of its ravages on currant-bushes, the cultivators of which were invariably unaware of the cause. In Germany, I have been informed that the red-currant, in particular, suffers very extensively from this insect.

The Corn-Weevil or Grain-Weevil (*Calandra granaria*, or *Curculio grannarius*.)

This insect is a beetle about the eighth of an inch in length; its colour is blackish brown, and its thorax is punctured, and about half as long as the body.

Some of my readers have, perhaps, no idea of the vast extent of serious injury which this insect commits; but many a farmer already knows, to his sorrow, that it often abounds in granaries and corn lofts, and stealthily devours nearly the whole of their valuable contents. It also eats malt, dry beans, and peas, the ground peas used on board ship, and ship biscuits. Baekner, who remarks that it is more hurtful to corn than the mouse, and soon destroys it all, if not continually ventilated and raked, adds that, "when it gets among lentils, it destroys them to such an extent, that the merchant is obliged to sell them at a great

loss, or fling them away."—*Aménités Académiques*, vol. iii.

The female, by means of her long proboscis, perforates a small hole in a grain of wheat, barley, &c., and in this she deposits a single egg. In this way she perforates five or six grains, and deposits as many eggs daily, for several successive days. In about a week after being deposited, the eggs hatch, and the grubs continue to live inside for some time, devouring meanwhile the interior or farinaceous parts of the grain. When they have grown to their full size, and fed their accustomed time, they transform into their chrysalis state inside the husk, which they quit about a fortnight afterwards, when they have transformed into their beetle state.

Kirby and Spence calculate that a single pair of weevils may produce in one season 6000 descendants; and an extensive brewer told them that he had collected and destroyed them by bushels. Leuwenhoek says that the females do not die after depositing their eggs, but, contrary to the usual case, they continue to live throughout the summer and winter, feeding voraciously on the farinaceous portion of the grain. It may be observed, that these pests may be found in the grub, chrysalis, and beetle states contemporaneously, and throughout the year.

I will now proceed to enumerate whatever recommendations I have met with for getting rid of them, and one or two hints which I would also suggest.

"To rid a granary of these destructive insects, it has been recommended to farmers to spread their corn in the sun, when they will creep out of their holes, and by often stirring the corn while in this situation, it is supposed they may be completely expelled. It is also said that they may be destroyed by strewing boughs of elder, or branches of henbane among the corn."—*Edinburgh Encyclopædia*, iii. 1827.

In Barnaby Googe's translation of Heresbach's *Four Boeckes of Husbandrie* (1586), we are told that some persons wash the walls, ceilings, and floors, of the granary "with lime and the urine of cattle, as a thing that will destroy weevils, or the leaves of houseleek, of wormwood, or hops: but, specially if you have it, there is nothing so good to destroy all such vermin, as the dregges and bottom of oil: some use, instead thereof, the pickle of herrings. Having done so, and their floors being dry, they suppose that no hurtful worm shall annoy whatsoever corn they lay in them. Some lay under their corn, fleewort. \* \* \* But for all this, experience teacheth us that there is not so good a remedy to destroy the wyrvil, as the often fanning and winnowing in summer."—p. 43 a.

"M. de la Nux, of the Isle of Bourbon, a correspondent of the Academy of Paris, recommends the use of tobacco, either green or in rolls, as a preservative against weevils. These animals will come to the tobacco from all parts, and, having eaten of it, certainly die."—*Weston's Tracts on Agriculture*, 1773, page 291.

The Rev. F. W. Hope says that it is the common practice in some parts of Spain to expose the corn to a heat of 150 degrees, or more, for the purpose of destroying these insects.

In the *Manchester Telegraph* we are told, that "a French farmer accidentally discovered a very simple mode of destroying weevils. Happening to place some sheep-skins, with the fleeces on, in the corner of the granary, in which there was a little quantity of corn, he was surprised to find them in a few days covered with dead weevils. He repeated the experiment several times, and always with the same success. At length he ordered his corn to be stirred up, and not a single weevil remained in it. It appears, therefore, though the cause has not yet been ascertained, that greasy wool, when in the neighbourhood of weevils, attracts and destroys them."

It has been recommended to establish a colony of ants near a granary infested by weevils, on the supposition that the ants would soon find their way into the granary, and feed upon the grubs. Whether the ants would do so or not, I cannot venture to decide; but Bosc says that *Cerceris aurita*, *C. quadrifasciata*, and several other species of solitary wasps, collect weevils and store them up in their nests as provision for their young.—*Annales de l'Agriculture*, vol. 53.

Messrs. Begby and Young, the extensive corn-merchants, who have had great quantities of grain destroyed by these insects, informed a friend of mine that they some time since tried the experiment of sinking some sacks of corn in the Thames, for the purpose of destroying these pests, but the attempt to drown them was unsuccessful. The result was no more than what I should have anticipated, because however deep the sacks might be under water, there would still remain, confined between the close mass of grain, sufficient air to permit the insects to breathe and live.

It seems to me that electricity might be most effectually employed to destroy these and other insects in grain and pulse, provided that these be only intended for consumption, and not for sowing. The infested grain might be enclosed in insulated troughs or vessels of the necessary construction and dimensions, and an electric shock might then be passed through it, sufficiently powerful to kill the insect instantly.

That this would kill them, there can be no doubt: but as prevention is better than cure, I shall proceed to notice a plan of housing grain, so as to protect it from the invasion of insects.

Twelve years ago, General Demarçay converted an ice-house, on his estate in France, into a granary, with most satisfactory results. It is sufficiently deep to be beyond the influence of atmospherical changes, and he has lined it with wooden planks, so as to form a large case, which, being at some little distance from the bottom and sides of the ice-house, is not exposed to the damp of the surrounding earth, and has a free circulation of air round its exterior. The corn being stored in so as to fill the case to within a yard of the top, three layers of loose planks are placed above, at a third of a yard distance between each, and then a conical roof of thatch is formed over the whole. In this way the same grain has been kept among the ice, without sustaining the slightest injury; and it is remarkable, that some newly-threshed corn, which was quite wet when stored in it, was, three weeks afterwards, found to be quite dry and glossy. Hence, I think that if granaries were in future so contrived as to be surrounded by ice, they would escape from the attacks of this and other insects, and the saving would soon repay any expense and labour which might attend the construction of ice-houses for this express purpose, and the occasional addition of fresh ice. Indeed, the expense of forming such depositories would be much less than that of building granaries and corn-lofts, which afford the grain no protection whatever from insects, but, on the contrary, owing to their receiving the heat of the sun, encourage them about the grain. If even there were any weevils or grubs in the corn at the time of its being put into the ice-granaries (as they might be called), yet, although they would perhaps live in it a short time, they would die without breeding, thus leaving no generation behind them.

#### GREEN FLY ON WALL FRUIT.

SIR,—It has often been a matter of great surprise to me, that, so many intelligent men as belong to the science of gardening, no effectual means have been adopted to prevent the evil effects that are produced by the green fly on peach and nectarine trees on walls. After the gardener has effectually protected the blossom from the cold winds and frosts in spring, so that there are plenty of fruit set, his hopes are all blasted by the intrusion of that pestiferous insect, which begins to infest trees as soon as the leaf buds begin to expand, which can be easily observed by the bursting of the

leaves; and if left without something being done to prevent them, they will entirely destroy the trees. It is evident that when the young wood begins to push, the leaves get infested, consequently it prevents the free circulation of sap in the shoot; and if the tree is not very luxuriant, they kill the shoot; if not, it retards the growth till later in the season, when there is no sun to ripen the wood. The following year there may be blossoms on the shoots, but owing to their being so imperfectly ripened, they are incapable of producing them healthy, consequently the parts of fructification being very imperfect, they are incapable of performing their office; therefore the fruit seldom or ever sets upon such trees: and trees thus emaciated in disease are a disgrace to the gardener, and an eyesore to his employer. The fly may be kept under in some places, where the trees are not so much infested as others, by applying water with the garden engine; but the weather will not always admit of that being done at that season of the year. Snuff may be put on the leaves, which will kill them; but that takes a long time when there are many trees.

The plan that I would recommend, is to have posts, four inches square, fixed perpendicularly into the wall, flush with the bricks at equal distances, at the extremity of the branches of each tree, and one of the same dimensions to go along the top, and to have a frame made to fit close to these posts by means of hand screws, so that it may be taken off and on at pleasure; the wood of the frame should project six inches or more from the wall, and be covered with oil or wax cloth, or any other substance that will prevent smoke from escaping. The fixtures in the wall should be painted so as to represent the bricks, which will take away their unsightly appearance. Then take a No. 32 sized pot, make a hole in the side of it, put in a piece of lighted wood, and fill it with tobacco paper; lift up the bottom of the cloth, which will be loose, and put in the pot behind the cloth; have a hole in the cloth as much as will let in the pipe of the bellows opposite to the hole in the pot; proceed then to blow till the space between the cloth and the wall is completely filled, and in half an hour they will be all killed. The portable frame then can be removed to the next tree, and so on till they are all done. If it be a fine day or evening when done, the tree should be well watered with the garden engine. The ground below the trees should be either dug or well beat with the spade, to prevent any of them from getting upon the trees again, as some of them might when exposed to the fresh air, and in a few days they would be as bad as ever, owing to

the rapidity with which they multiply. Before commencing to smoke the trees, they should be all distudded, that is, taking away all superfluous shoots, and leaving none but what are necessary; it would let the smoke act more freely on them that are left.

Should you think these remarks worthy of a place in your valuable publication, they are at your disposal; and should any of your numerous readers try the experiment, I should be happy to learn the result of their proceedings through the medium of any of the publications of the day.

#### A VISIT TO THE ROYAL GARDENS AT VERSAILLES.

A SHORT account of a visit lately made to the gardens attached to the Palace at Versailles has been published by M. Bailly de Merlieux, member of the French Society of Horticulture. He was conducted by M. Massé, the talented director, through the whole, and expresses himself in high terms of the manner in which they are conducted. A few extracts may, we are of opinion, prove interesting. One of the subjects to which M. Massé has paid the greatest attention, is the communicating heat to hot-beds. Those in the king's gardens are exceedingly numerous, and the modes of imparting heat are various;—1st, by stoves with earthen pipes to carry off the smoke;—2ndly, by the circulation of steam through pipes, from whence the heat is communicated to stones, which preserve it for a considerable period—an excellent thing, as too prompt a cooling is attended with great inconveniences;—3rdly, by layers of manure or leaves placed outside, whilst the pots are placed inside;—and 4thly by the circulation of hot water. M. Massé, by frequent experiments, has proved the circulation of hot water to be as economical as manure; besides, this latter mode of heating cannot be applied to frames which are at all large, nor can it procure heat beyond a certain degree. It may be inferred from the opinion of M. Massé, that hot water is the principal mode of heating employed in the Royal gardens. The chief part of the pipes are made of copper, exceedingly thin, yet they have stood so well, that for some years not a drop of water has leaked through. Zinc pipes appear to be decidedly rejected, on account of their rapid oxidation and their consequent inutilty. But the pipes which M. Massé thinks best, both on account of their durability as well as their cheapness, are those made of galvanized iron. It seems best to give them a flattened shape, as they then present a greater surface, which hastens the circulation of the

water, and gives heat more rapidly. Pipes of this description made of galvanized iron 100 feet long, will only cost 100 francs.

M. Massé has established, for two years, in the square known by the name of the Vigne d'Anjou, a mode of treating the branches of pear-trees, which appears important. These trees were often unproductive, as is often the case, in consequence of too great a development. One hundred and twenty trees treated as we are going to describe, produced in 1838, rather an indifferent year for pear-trees, 14,000 pears, sufficiently fine to be sent to the palace for the king's table. This result was obtained by bending the branches of them only since 1837. By this method, which is not by any means new, but which has been adopted here very extensively and very cleverly, the branches have given an abundance of fruit-buds. The winter pruning consists simply in cutting the extremities of the bent branches, and to tie those branches whose strings, generally of twine, may be broken. This arrangement of the branches, besides producing an abundance of fruit, has also the other advantage of avoiding the unfurnishing the bottom of the stem, and preventing the great extension which it is so difficult to avoid in the upper part of the trees. All the trees in the bed, treated in this manner, present so handsome an appearance, that it ought to be admitted as a principle that this mode of cultivation is the preferable one. Several grafts of a year's growth have had the shoots bent down in this manner, and have borne fruit the year after; so that, by this method, the produce of a new variety of fruit can be ascertained in two years. M. Massé has applied the same mode of treatment to other fruit-trees, as well as pear-trees.

In the Versailles Garden may be seen espaliers cut and trained in various ways. Those which are in the most prosperous state, and which produce fruits in greatest abundance, are not those arranged like an open V, but those arranged like a palm-tree. M. Massé is of opinion that this plan, most generally adopted for the pear-tree, ought also to be tried for the peach-tree. He adds, that for these two trees it is essential to merely form each year two arms, one at each side.

#### A CHAPTER ON WARMING AND VENTILATION.

MR. HOOD's excellent volume on this subject contains no less than three hundred and forty pages; and the following remarks, gleaned from that source, are both interesting and useful. The various methods of warming buildings have consisted, in all countries and in all

ages, until a very recent period, of the rudest appliances and the most inartificial inventions. At a very early period, it is true, the Romans were acquainted with the method of heating rooms and buildings by flues; and these were elaborate in their construction, and complicated in their arrangements. But they were so expensive in their construction, and so wasteful in their expenditure of fuel, that this method of warming buildings could only be adopted by very few of even that rich and luxurious nation. The comparatively late invention of chimneys fully accounts for the immense size and peculiar construction of the flues used by the ancients; for unless a large space were provided for the combustion of the fuel and the entrance of the air, the heat could not have been conducted through the flues, owing to the absence of the necessary draught produced by the use of a high chimney. The *hypocaustum* of the Romans was this plan of flues. It appears to have consisted of a long furnace; and a number of narrow arches (*testudines alvei*) received the fire of the hypocaustum, and conducted it along and underneath the floor of the room to be warmed. The whole of the hypocaustum was immediately below the room which was to be heated. Sometimes a great number of short columns or pillars supported the floor instead of these arches. They were set in four rows very close together, and the flame of the furnace passed between them, as appears by some very perfect specimens which have been discovered. Pliny the younger, in his letter to Gallus, giving the description of his villa Laurentinum, mentions that his bedchamber was warmed by a small hypocaustum: and this plan was generally adopted in heating the baths. For this latter purpose, however, an improved method was adopted when the Thermæ of Rome were built, and which has been described by Seneca. The water of the bath was heated by passing it through the fire in a brass pipe, of a serpentine form, thence called *Draco*. The most approved mode was to employ the *Miliarium*, which appears to have been a leaden vessel of large circumference, the middle part being open for the spiral pipe, and for the draught of the fire to pass through. This vessel of water that surrounded the flame was also placed upon part of the same fire, and for that reason the bottom was obliged to be made of brass, as were also the pipes.

But the method of warming by the hypocaustum was far too expensive for general use. The Romans used portable furnaces, containing embers and burning coals, to warm the different apartments of their houses, which were placed in the middle of the room. These

were sometimes made to contain water, which was heated by the fuel of the furnace, and probably they were also used for cooking. One of these boilers and furnaces, found at Herculaneum, was in the shape of a castle with four towers. The usual kind of stoves, however, were nearly on the plan of our braziers. They were mostly elegant bronze tripods, supported by satyrs and sphinxes, with a round dish above for the fire, and a small vase below to hold perfumes, which were thrown into the brazier to correct the smell of the coals. A square stove of bronze, of the size of a moderate table, found at Herculaneum, rested on lions' paws, and was ornamented upon the border with foliage. The bottom was a strong iron grating, walled up with bricks above and below, so that the fire could not touch the sides of the stove, nor fall through the bottom. It was similar to those still used in large rooms in Italy. But the smoke from these stoves was so considerable, that the furniture of the winter rooms was different from the summer rooms; and Vitruvius expressly states that these winter apartments had plain cornices, and were without carved work or mouldings, in order to allow the soot to be easily and frequently cleaned away. At great entertainments it was usual to have watchmen stationed ready to extinguish any fire which might happen; the smoke issuing from the kitchen windows being so great on these occasions, that it was common to speak of this great smoke as synonymous with a great entertainment. The utmost care, however, was taken to prevent the smoke as much as possible, and to procure wood, which gave the smallest quantity of smoke in combustion. A great deal of the fire-wood used by the Romans was procured from Africa. The bark of the wood was peeled off, the wood was then suffered to lie a long time in water, and afterwards dried and anointed with the lees of oil, which was considered the most effectual way to prevent it from smoking. In the time of Seneca (A.D. 64), another method of heating buildings was adopted; which consisted of pipes built in the walls, that conveyed the heat from a furnace, constructed in the earth under the edifice. These pipes or flues were conducted to the different rooms; and the upper end was often ornamented with the representation of a lion's or a dolphin's head, or any other figure, and it could be opened or shut at pleasure. These pipes, however, were liable to become full of soot; and as they were very likely to catch fire by being over-heated, laws were made forbidding them to be brought too near to the wall of a neighbouring house.

The Persians used a stove consisting of an iron vessel sunk in the earth in the centre of

the apartment. After a fire had been kindled, and had well warmed the place, a wooden top, like a small low table, was placed over the hole in the floor which contained the stove, and this top was then spread with a large coverlet quilted with cotton, which hung down on all sides to the floor. Those people who were not very cold, only put their feet under the table or covering; but those who required more heat, put their hands under it also, or crept under it altogether. The Jews likewise used such stoves in their houses, and the priests had them also in the temple: in fact, throughout the east, this mode of warming apartments appears to have been commonly adopted.

In China, a very elaborate system of flues has been long in use, by which the floors of the rooms are heated by a furnace constructed below, with a moderate expenditure of fuel. A very equable temperature appears to be maintained by this means, notwithstanding the winter temperature of some parts of China is so low, that the thermometer nearly reaches the zero of Fahrenheit's scale. Father Gramont described this mode of heating in 1771, but the date of its introduction does not appear to be known.

Although the Romans must have introduced their methods of warming buildings into England at a very early period, as appears by various remains which have been excavated in recent times, the inhabitants of Britain long contented themselves with contrivances of the rudest and simplest character. Among the Ancient Britons, in each dwelling there was only one place for a fire, which was merely a hole in the centre of the floor. In the time of the Anglo-Saxons, the ordinary plan was to place the ignited fuel on the hearth in the middle of the floor, and an opening in the roof, immediately above the hearth, permitted the escape of the smoke. In the better class of buildings, an ornamented turret was erected in the centre of the roof for carrying off the smoke, while in ordinary houses the opening in the roof was merely defended from the weather by louver boards, in the manner now practised in many of our commonest buildings used for manufactories.

The invention of chimneys necessarily made a great alteration in the mode of heating buildings. The date of their introduction has been much debated: but there appears to be no positive evidence of their existence before the middle of the fourteenth century; the earliest record being, that an earthquake at Venice in 1347 threw down a great many chimneys. Twenty years after this they appear to have been unknown at Rome; for in that year Francesco da Carraro, lord of Padua, came

to Rome, and finding no chimneys at the inn where he lodged, he caused two chimneys to be built by workmen whom he had brought with him; and over these chimneys, the first ever seen at Rome, he caused his arms to be affixed. This slow communication of such an important invention, so closely connected with health and comfort, contrasts most strangely with the rapid promulgation of every discovery and improvement of the present time.

The introduction of chimneys into England appears to have been in the reign of Richard II.; and one of the first is supposed to have been at Bolton Castle built in this reign. It was long before they came into general use; but in the reign of Elizabeth most rooms in respectable houses were furnished with them, and apologies were made to visitors if they could not be accommodated with rooms with chimneys.

It is uncertain at what time stove-grates were first used, though probably they were not invented till coals became the ordinary fuel. For though coals were known to the Britons before the arrival of the Romans, their use was barely tolerated in England till the seventeenth century, as it was supposed that the air was rendered unwholesome by their use.

After the improved method of burning fuel under open chimneys was introduced, they were used not only as the receptacle for the fire, but they also became the ordinary place of resort for conversation and conviviality for all the inmates of the house. The chimney-corner was the post of honour; and the custom of the whole family sitting under the chimney-breast is not even yet exploded in some of our rural districts.

The earliest writers who endeavoured to improve the construction of stoves were Kessler of Frankfurt, in 1614; Savot, in 1625; Glauber, 1669; and Delesme, in 1686. In 1713, (or perhaps even in 1709) the Cardinal de Polignac, under the assumed name of M. Gauger, published a most excellent treatise on the construction of fireplaces, which in 1715 was translated and published in this country by Dr. Desaguliers. This treatise, which is now scarce contains a most lucid explanation of the methods of economizing fuel, based on the soundest principles of philosophy. It was the first attempt which had been made to apply the known laws of heat to the construction of fireplaces; and though in consequence of wood being the fuel universally used in France at that period, and this fuel being always burned upon the hearth, the author made no mention of stoves, but merely of fireplaces, the translator Dr. Desaguliers added a chapter on the stoves to be used in these improved fireplaces; and the work in

that new form was a complete epitome of all those principles which Franklin, and after him, Count Rumford, so successfully brought under the public notice, and which, if strictly carried out, would form, even at the present day, the best guide to the proper construction of stoves and fireplaces. An epitome of this little work would be, in fact, a recapitulation of all the most approved methods of constructing fireplaces, stoves, and chimneys; but most of these principles are now too well known to require explanation, and others which are less so, will be touched upon in another form in the course of this treatise.

The word *stove* is used in this treatise to signify either a close or an open fire-grate to burn fuel in; and, in general, this is what the word is now supposed to mean. In horticulture, the building itself, which is heated, and not the place which holds the fire, is called a stove, and this expression is employed by many old writers. Anciently, however, the term *hothouse*, which we now use to signify a building for horticultural purposes, was descriptive of a sudorific bath, the use of hothouses for the purposes of horticulture being an invention of comparatively a recent date. At the beginning of the seventeenth century, hothouses were used for the cultivation of orange trees, and were considered a mark of royal magnificence.

The various elegant forms given to the stove grates of the present day are quite a modern invention. Formerly they were called "cradles of iron for burning sea-coal," from which we should suppose them to be very different in construction to ours; and even those described in Dr. Desagulier's work, as late as the beginning of the eighteenth century, are nothing more than a few bars bent into a semicircle and fastened into the back. How far the utility of stove-grates has been affected by the modern alterations of form, we shall endeavour to show in another chapter; and subsequently we shall inquire into the physiological effects produced by some of the modern methods of distributing artificial heat.

#### COTTAGE GARDENING.

THE success of the allotment system is highly gratifying, but we are sorry to observe, that in many places the benevolent people who are promoting it by letting small pieces of ground seem especially to have taken care of themselves. Now, we consider it a very cruel thing to impose upon the poor creatures who take small allotments, at a rental of one shilling per rod; and we do know that this, which is at the rate of eight pounds an acre, prevails in many places, and is a good deal too much;

we should not think so much of it if the *benevolent* landlords were less pretending, but there is something odd in seeing one of these gentlemen spouting at a meeting about the advantages of promoting industry among the cottagers, by the creation of small gardens, and next parting his acres, which are worth three pounds, into small allotments at the rate of eight. We have a great desire to serve the cottager, and we call upon those who now demand a shilling a rod to at once reduce it to half, for a poor man, whose labour is his only property, can as ill afford to pay eight pounds an acre as the farmer who employs him. If this be not attended to on the part of the *benevolent* landlords, we shall be very apt to expose a system so fraught with evil. It is the same kind of offence in the moral scale as charging double price for any thing the poor man cannot do without, and it is discreditable to make a property of the poor man's prudence. We do not intend to mention names, there are among the parties many who should rather give land rent free, than charge too much, because they are wealthy and could afford it. The cottage gardener cannot be too much encouraged; parishes should procure ground, and allot it at low rents, if they have none of their own to divide, for men are never idle in the strict sense of the word. They must be doing something, when they are not earning money they are spending it, unless they find some inviting occupation, and there is no better test of a man's industry, frugality, and general disposition than a little garden. There is an air of independence about the man who can grow his own vegetables, and his family has the advantage of his productive labour in the garden, while he is adding to his own enjoyments. How very desirable then is it to encourage such industry by every means in our power, instead of imposing upon it a tax of double rental. Gentlemen, pray let us have to record on no very remote occasion, a general reduction of rent to the same standard as if it were paid by the acre.

#### THE HORTICULTURE OF MEXICO.

IN this strange land of turbulence and wealth, there seems very little trouble needed in the culture of its native products; it may be called the land of plenty, for vegetation is rapid, and the earth bountiful. Mexico has been lavish of her favours to the Horticultural world, and many of our floral beauties owe their introduction to Europe to the conquest of this celebrated continent by the Spaniards. The history of that conquest by Prescott is a work that will be read with intense interest by



our Horticultural friends, as it contains much that concerns the lovers of gardens. We learn from that source that among the most important articles of husbandry, we may notice Bananas, whose facility of cultivation and exuberant returns are so fatal to habits of systematic and hardy industry\*. Another celebrated plant was the Cacao, the fruit of which furnished the chocolate,—from the Mexican *chocolate*—now so common a beverage throughout Europe. The Vanilla, confined to a small district of the sea coast, was used for the same purposes, of flavouring food and drink, as with us. The great staple of the country, as, indeed, of the American continent, was Maize, or Indian corn, which grew freely along the valleys, and up the steep sides of the Cordilleras to the high level of the table land. The Aztecs were as curious in their preparation, and as well instructed in its manifold uses, as the most expert New-England housewife. Its gigantic stalks, in these equinoctial regions, afford a saccharine matter, not found to the same extent in northern latitudes, and supplied the natives with sugar, little inferior to that of the cane itself, which was not introduced among them till after the conquest. Hernandez [Hist. Plantarum, lib. vi. c. 44, 45.] who celebrates the manifold ways in which the Maize was prepared, derives the name from the Haytian word *Mahiz*. But the miracle of nature was the great Mexican Aloe, or *Magney*, whose clustering pyramids of flowers, towering above their dark coronals of leaves, were sprinkled over many a broad acre of the table land. Its bruised leaves afford a paste from which paper was manufactured; † its juice was fermented into an intoxicating beverage, *pulque*, of which the natives, to this day are excessively fond; ‡ its leaves further supplies an impenetrable thatch for the more humble dwellings; thread of which coarse stuffs were made, and strong cords, were drawn from its tough and twisted fibres; pins and needles were made of the thorns at the extremity of its leaves, and the root, when properly cooked

was converted into a palatable and nutritious food. The *Agave*, in short was meat, drink, clothing, and writing materials for the Aztec! Surely, never did nature enclose in so compact a form many of the elements of human comfort and civilization!§ It would be obviously out of place to enumerate in these pages all the varieties of plants, many of them of medicinal virtue, which have been from Mexico into Europe. Still less can I attempt a catalogue of its flowers, which, with their variegated and gaudy colours, form the greatest attraction of our greenhouse. The opposite climates embraced within the narrow latitude of New Spain, have given to it, probably, the richest and most diversified flowers to be found in any country or the globe. The different products were systematically arranged by the Aztecs, who understood their properties, and collected them into nurseries, more extensive than any then existing in the Old World. It is not improbable that they suggested the idea of those “gardens of plants,” which were introduced into Europe not many years after the conquest. The first regular establishment of this kind, according to Carli, was at Padua in 1545, (Lettres Americ. tom. 1. c. 21.)

*The Garden of an Aztec Monarch*—1400 to 1500 (A.D.)—Nezahualcoyotl's fondness for magnificence was shown in his numerous villas, which were embellished with all that could make a rural retreat delightful. His favourite residence was at Tezcozincó, a conical hill, about two leagues from the capital. It was laid out in terraces, or hanging gardens, having a flight of steps, 520 in number, many of them hewn in the natural porphyry. In the garden, on the summit, was a reservoir of water, fed by an aqueduct, that was carried over hill and valley for several miles, on huge buttresses of masonry. A large rock stood in the midst of this basin, sculptured with the hieroglyphics representing the years of Nezahualcoyotl's reign, and his principal achievements in each. On a lower level were three other conservatories, in each of which stood a marble statue of a woman, emblematic of the three states of the empire. Another tank contained a winged lion, cut out of the solid rock, bearing in its mouth the portrait of the emperor. His likeness had

\* Oviedo considers the *Musa* an imported plant; and Hernandez, in his copious catalogue, makes no mention of it at all. But Humboldt, who has given much attention to it, concludes, that if some species were brought into the country, others were indigenous. If we may credit Clavigero, the Banana was the forbidden, that tempted our poor mother, Eve.—See *Essai Politique*, tom. ii., 382–388.—Stoir del *Musico*, tom. i., 49, nota.

† And is still, in one spot, at least, San Angel, three leagues from the capital. Another was to have been established, a few years since, in Puebla.—See Report of the Committee on Agriculture to the Senate of the United States, March 12, 1838.

‡ Before the Revolution, the duties on the *pulque* formed so important a branch of revenue, that the cities of Mexico, Puebla, and Toluca, alone, paid \$17,739 dollars to government.

§ Hernandez enumerates the several species of the *Magney*, which are turned to these manifold uses. [De Hest Plant., lib. vii., cap 71.] Humboldt considers them all varieties of the *Agave Americana*, familiar in the southern parts, both of the United States and Europe. [Essai Politique, tom. ii., p. 487, and seq.] This opinion has brought on him a rather sour rebuke from our countryman, the late Dr. Perrine, who pronounces them a distinct species from the *American Agave*, and regards one of the kinds, the *pita*, from which the full thread is obtained, as a totally distinct genus.—See Report of Committee on Agriculture.

been executed in gold, wood, feather-work, and stone, but this was the only one that pleased him. From these copious basins the water was distributed in numerous channels through the gardens, or was made to tumble over the rocks in cascades, shedding refreshing dews on the flowers and odoriferous shrubs below. In the depths of this fragrant wilderness, marble porticos and pavilions were erected, and baths excavated in the solid porphyry, which are still shown by the ignorant natives as the "Baths of Montezume!" The visitor descended by steps cut in the living stone, and polished so bright, as to reflect like mirrors. Towards the base of the hill, in the midst of cedar groves, whose gigantic branches threw a refreshing coolness over the verdure in the sultriest seasons of the year, rose the royal villa, with its light arcades and airy halls, drinking in the sweet perfumes of the gardens. Here the monarch often retired, to throw off the burden of state, and refresh his wearied spirits in the society of his favourite wives, reposing during the noontide heats in the embowering shades of his paradise, or mingling in the cool of the evening in their festive sports and dances. Here he entertained his imperial brothers, of Mexico and Ilacopans, and followed the hardier pleasures of the chase in the noble woods that stretched for miles around his villa, flourishing in all their primeval majesty. Here, too, he often repaired in the latter days of his life, when age had tempered ambition, and cooled the ardour of his blood, to pursue in solitude the studies of philosophy, and gather wisdom from meditation. The extraordinary accounts of the Tescucan architecture are confirmed, in the main, by the relics which still cover the hill of Tezcotzinco, or are half buried beneath its surface. They attract little attention indeed in the country, where their true history has long since passed into oblivion; while the traveller, whose curiosity leads him to the spot, speculates on their probable origin, and as he stumbles over the huge fragments of sculptured porphyry and granite, refers them to the primitive races, who spread their colossal architecture over the country, long before the coming of the Acolhuans and the Aztecs.—*Prescott's History of the Conquest of Mexico.*

#### ROSES ADAPTED FOR POT CULTURE.

*Bourbon.*—This class of Roses is truly elegant. It has also been much extended lately, and become more varied, by the introduction of many purple, crimson, and blush Roses. Before the appearance of these, the Bourbons were nearly all of a rose colour. Probably, the dark varieties now obtained have something of the Chinese in them; but should the

crossing not affect their hardiness, which I venture to predict it will not, they will rival, and, in one point (profusion of bloom), surpass their progenitors. The colours of the Bourbon Roses are very clear; the petals smooth, thick, and large, and generally well-formed:—\*Amarantine, lively rose. Armosa, fine bright pink. Augustine Lelieur, vivid, even rose. Celimene, fine clear blush. Comte de Rambuteau, clear reddish violet. Coupe d'Hebe, deep rose. Delille (new), deep rose, finely formed. \*Desire Roussel, clear flesh. Dumont du Courset, very deep crimson, often shaded. George Cuvier, bright cherry, edged with clear rose. Gloire de Paris, bright dark crimson violet. Grand Capitaine, rich carmine. Madame Nerard, silvery pink blush. Madame Souchet, pale rose when opening, often edged with lake. Paul Joseph, superb velvety crimson. Princess Clementine, violet red, changing to purple. Queen, buff rose, fine. Souchet, large, rich crimson purple. Souvenir de Dumont — d'Urville, cherry, changing to violet. Speciosa, full, shaded rose. Theresia Margat, bright pale rose. Virgil, rose, finely formed.

(*T.*) *Chinese, or Bengalee.*—Among the Autumnal Roses these are very valuable, being continually in flower. They group admirably with the Tea-scented; and their colours being in part those which are deficient among the latter, they are the more to be valued. The *Lawrencianas* are very pretty Roses; but do not group well with any others. A few varieties will be given here; for when the plants become of some size, and are covered with their diminutive buds and blossoms, they are really interesting objects. They delight in a light sandy soil. Abbe Mioland, rosy purple, striped. Alba, or white. Augustine Herseut, deep pink. Cramoisie superieure, bright velvety crimson. Duchess of Kent, white, edged with rose. \*Fabvier, scarlet. Madame Breon, large brilliant rose. Madame Chavent, large rosy pink. Madame de Rohan, blush white. Mrs. Bosanquet, beautiful pale flesh. Napoleon, large blush pink. Prince Eugene, crimson purple. Reine de Lombardie, rose, blush and crimson, variable.

*Laurencianas.*—Alba Minor, white. Ca-price des Dames, pink. Fairy, pale rose. La Laponne, bright pink. Pumila, rose. Rubra, brilliant crimson.

(*T.*) *Tea-scented.*—These are, in fact, but a selection from the Chinese, on account of their peculiar odour and shining foliage. They are well suited for growing in pots; they are tender, and should have some protection from frost in winter. The best way of growing these and the preceding class, is, perhaps, in pits, as previously advanced, where they may

be sheltered from the cold nights or rough weather, at any season, by placing the lights on. They are excellent forcing Roses, and more admired than any others when grown in pots, the tints being rich and delicate:—Adam, large clear rose. Archiduchesse Therese, creamy white and yellow. Bardon, bluish and salmon pink. Bride of Abydos, creamy white, tinged with rose. Caroline, rose and bluish pink, shaded. Cels multiflore, pale flesh. Clara Sylvain, white, centre cream. Comte de Paris, large flesh-coloured rose. Comte d'Osmond, white, centre yellow. Devoniensis, large, pale yellow. Don Carlos, pale buff and salmon. Eliza Sauvage, fine yellow, centre orange. Eugene Desgaches, bright rose. Goubalt, large rich rose, centre buff. Josephine Malton, large shaded buff and white. Julie Mansais, delicate pure white, large. La Renomme, white, centre pale yellow, fine. Lyonnaise, large, rose and lilac, shaded. Madame Dupuis, white, centre rose and yellow. Madame Roussel, white, centre flesh. Mansais, large rose, shaded with buff. Nina, fine clear flesh. Pellonia, pale yellow. Perfection, nankeen, centre rose. Taglioni, creamy white, buff centre. It would be useless to offer any remarks as to which of the preceding should be grown as dwarfs, and which as dwarf standards; for most of them do well in either way. This, then, is better left to the option of the cultivator. The classes which the letter *S* precedes are Summer Roses; the others continue flowering throughout the Autumn; during which period they should be plentifully supplied with water. The letter *T*, preceding any class, indicates that the varieties of which it is composed require protection in winter.—*Paul and Son's List of Roses.*

#### PROPERTIES OF FLOWERS AND PLANTS.

AMONG all the advances made in the progress of floriculture, scarcely anything has outstripped, if it has equalled, the advance of the Calceolaria. The original varieties we believe to have been *Arachnoidea* and *Corymbosa*. At least we have the authority of Mr. Green for the fact, that he raised all his beautiful varieties originally from these two kinds. Others were raising new varieties, at the same time, and almost simultaneously, vastly improved varieties were produced by different persons, but none so fine as Mr. Green's. There was but one way to do this, Mr. Green saved seed constantly from the best, and sacrificed all that were worse than the parent. In a paper contributed to the Chronicle, Mr. Green gives the following account of the origin, and progress of his operations;—

"The original patents of my Hybrids were *C. Corymbosa* and *C. Arachnoides*, which pro-

duced many beautiful varieties of the herbageous kind. After several years' improvement, I selected some of the strongest, largest, and most distinct blooms, and crossed them with *C. Viscocissima*, from which most of my shrub kinds have been raised."

This at once shows the folly of those professors who sneered at hybridizing, in the crossing species, as we have heard them in their little lectures and passing remarks on the flowers placed before them. Mr. Green's success was complete, and we owe many of the most beautiful of the new Calceolaries which are six times the size of the originals to his perseverance. We do not agree with Mr. Green about the properties which would constitute perfection; because, while anything would make an improvement, we can only recognize the accomplishment of that improvement as perfection. However, this belongs rather to our set rules than to the open discussion on the properties of flowers; our object was to show what advances had been made by Mr. Green in the Calceolaria, and then to dispute about his notions of perfection, which however we present as copied from the Chronicle, with a view of hereafter disputing it in a very essential point. Another of the flowers which rapidly improved in the days in which it flourished was the Hollyhook, which comprises all shades and colors but blue and scarlet. The Dahlia checked its progress, though there were many full and double flowers in great variety, some bearing names after the manner of florists' flowers, and such is its noble appearance towering among shrubs, and at the backs of borders, that we do not despair of seeing it again the favoured flower among our autumnal beauties with certain improvements in its properties, which we shall point out. Most of the varieties have large poppy-like petals, which form a crumple circle, and a bunch of confused petals in the middle. We must see them with more of those circular petals, and forming a full half globular flower. We must have greater substance, that the bloom may not be so ephemeral. We have only to select a few of the best, save the seed, sow it, and continually save those which are best, and destroy the others the moment they bloom, and show their deficiency, that they may not spoil the seed of the better ones. Such is the certain progress of any thing taken up earnestly, when the growers know what they are trying for, and, as the Americans say, "go ahead."

#### MORPHOLOGY.

It is a fashionable theory to set up, that flowers are leaves modified, and that fruit are branches

stunted. The arguments in favour of this theory are, first—that parts of flowers are shown sometimes as leaves, and sometimes as flowers, and, which is far more imposing, sometimes as half leaf and half flower. Secondly—that if a tree is set full of bloom-buds, as they are called, if it be suddenly excited, those bloom-buds, instead of producing flowers, will produce branches. We are not disposed to go the lengths of some writers, and accuse the propounders of such doctrines of irreligion, because they were great men in their way, and close observers of nature, and may have jumped at conclusions hastily, without having once given it a thought that plants are as perfect in all respects as animals. Let us take their first reason for the assertion, that flowers are leaves in a modified form, that is, the fact that buds which indicate bloom, will occasionally turn into branches. Our theory is very different from this. The buds which indicate bloom, supposing them not to be disturbed, form all the petals, stamens, and other parts of a bloom. Now, it is quite certain, that if before this is forward enough to be fairly taking the sap of the plant to nourish it, any great excitement be given, the rudiments of branch buds, which prevail at every part of a plant, will be pushed into active growth, while the rudiments of the bloom and fruit, which receive the blight or check, perish, and fall away in dust or scales. To make ourselves understood clearly, let us suppose that all plants possess in all these parts abundance of the rudiments of branches, and of flowers and fruit. That, while the supply of nourishment is superabundant, and the temperature favourable, the branches grow vigorously, and if they are cut back, others are excited, and grow, and the plant generally is, as we say in ordinary garden practice, making wood; but when the supply is not superabundant, and there is no unnatural excitement, the rudiments of flowers and fruit begin to develop themselves, and, unless they receive a sudden and unnatural excitement again, or a check, before they are sufficiently advanced to bear it, they will perfect themselves, and fruit will follow, as a matter of course. Therefore, so long as the great supply of nourishment, and the favourable temperature, forces a plant into growth, it will not bear plentifully, if it bear at all; but so soon as the supply is moderated, that is, so soon as the tree is large enough to take all the nourishment its locality supplies, it blooms, and bears. This is what is commonly called being at maturity. Adapt the supply, by no matter what means, to this state, and a tree which would be induced to grow fifty feet before it fruited, may be fruited at ten feet. A tree or shrub, or plant, may be said, in the

language of common sense, to be possessed of the rudiments of branches, flowers, and fruit, in every part, to be naturally inclined to develop its branches and leaves, so long as plenty of nourishment is supplied, and when the tree or plant has become large enough to regulate its consumption to the supply, the rudiments of flowers and fruit which require the sap, in a more ripened state, develop themselves, in preference to more branches.

By shifting a plant from one pot to another, giving fresh soil and proper temperature, it can be forced into growth in season and out of season, without any symptoms of bloom or fruit, until it has attained the largest size it is capable of attaining, according to its nature; but the same plant could be so regulated, as to supply of nourishment and temperature, as to bloom and fruit much sooner. There is no disputing this fact. It is also illustrated by out of door trees, on walls, or otherwise. So long as the tree rapidly makes wood, it will not fruit abundantly, if at all. The various fanciful modes which have been adopted to regulate this supply of nourishment, so as to bring a tree into bearing, would, if detailed, fill volumes, but if such trees were left to time, they would, after attaining a given size—a size commensurate with the supply of the growing materials—bear as abundantly as any other. It is quite certain, however, that, until the consumption of nourishment is by the size of the tree made to correspond with the supply, or the supply of nourishment is curtailed to the consumption, there will be neither flowers nor fruit. Hence, in poor grounds, young trees bear earlier than in rich ones. In fact, while the excitement predominates, the branches develop themselves, and the rudiments of flowers and fruit lie dormant, and when, from the lessened supply of sap, the branches become less excited, the rudiments of flowers and fruit begin to develop themselves. Applying these facts to practical purposes, Mr. Rivers has adopted root pruning, with the greatest advantage, and could last year show pear trees, with hundreds of fruit, not too large to grow in a good bushel pot. Others have made a rule of cutting in all vigorous shoots, by which they have deferred the bearing time, because, as there are the rudiments of branches all over a tree, in every particle of it, the branches would be multiplied, and bearing postponed. But, those who would persuade us that flowers are malformed leaves, advance as a proof, a fact, which has no more to do with their argument, than it has with the attraction of the needle. They say, as a proof, that flowers are only leaves, bloom buds will change to branches, and grow. This advances,

if it does not actually prove, the soundness of our position. Let us take those plants which easiest illustrate this matter. The rhododendron will set full of bloom buds at the end of its growth; excite this very much, and before these bloom buds have got the ascendancy they will grow to branches; that which would have been flowers will all fall off in scales, blighted and destroyed, while the fellow plant shall not be excited, and the buds shall mature into perfect flowers. It proves for us, that these are the rudiments of branches in every part, even in the very bloom buds of a tree, and that when too much excited, the branches will grow till they can take it all, and that bloom buds, even when somewhat advanced, may be completely blighted, whenever this excitement sets the branches growing; but it does not prove that the leaves which are upon the branches would have been flowers, had the plant bloomed, the branch would have remained rudiments only, until the flower had gone by, and perhaps remained in embryo for years, or never have been developed. We know that it is quite possible for embryo branches to remain undeveloped for twenty, or, perhaps, for ought we know, a hundred years, but check the means of using up the nourishment provided by a root, and you will find branches which would never have been seen, making their way in places which were as unlikely as a paving stone. For instance, cut the head off a standard tree, of fifty years of age, and you will frequently observe branches from the thickest part of the trunk. In fact, it comes to this—so long as support is found for rapid growth, and temperature is favourable, so long will trees make new branches, or lengthen those already produced, and during that time the fruit and flower rudiments are dormant, although they, like the branch rudiments, are at every part of the tree; and, as soon as the branches are matured, and the nourishment properly regulated, which, by the way, nature herself will do at some period, the fruit and flowers will take their turn with shorter branches, and, like the leaves themselves, grow mature, and fall.

#### THE NECESSITY OF CONCENTRATING GARDENING INFORMATION.

THE most strange part of all that appertains to garden literature, is, that no one author has acted as if he were a general teacher of the science; and no one book-maker has endeavoured to get together all the valuable information on any subject. For the most part, good gardeners have been bad writers, and the writers on gardening bad gardeners. This has led to long, voluminous works, which, though

comprised of many different persons' writings, have had no master mind to say which is right or wrong, and therefore the reader is first left to grope his way among the dogmas of many people, until he is puzzled, and then left to guess as he best may which has told him right. Probably, a dose of this kind gave rise to *THE GARDENER AND PRACTICAL FLORIST*, a work professing to find all that has been written well upon gardening subjects, and republishing it, with remarks, promising to find out all the people who can write well, and employing them upon that in which they most shine, watching every improvement as it proceeds, and recording every thing worth a place in the permanent columns of the work. A work of this description has long been required—not that we have not had abundance of periodicals, for there have been more than could be either useful or ornamental. Men have, it is true, been supplied with Mr. Comfuzelum's mode of growing this, and Mr. Vonhumbugin's plan of growing the other; but if any body was ever wiser for reading either, it must have been somebody much more clever at seeing through a fog than we are. Now, there are two or three governing principles in the management of this work; first—nothing is recommended that has not been tried, and found to answer; therefore, if any one plan is unlike any other plan, it is because there are two ways of doing a thing, and both have been successfully employed. Thus, if a treatise on grafting recommended one thing, and some writer upon a particular tree recommended another, the reader need not be puzzling himself to know which is the better, but adopt that which is easiest to himself under his then circumstances; for he may be quite sure both are right, or they would not appear in *THE GARDENER AND PRACTICAL FLORIST*, the sole object of which is to collect all the good that was ever written, and publish the essence of it, and to secure what has not been written, as soon as anybody can be found to write it. Those, therefore, who possess parts of this work, and have not completed it, miss, so far as it has gone, one of the best works of reference that was ever published, and one which any young gardener, and any amateur gardener ought to prize beyond any work extant, because it goes to the root of everything. It does not, in its treatises on the culture of anything, begin as if the reader knew all about it beforehand, but it presupposes the reader to know nothing, and directs him accordingly.

#### IRRIGATION IN INDIA.

FREZIER in his voyage to the South Seas, says, the ancient Indians were extraordinarily in-

dustrious in conveying the water of the rivers to their dwellings; there are still to be seen in many places aqueducts of earth and of dry stones, carried on and turned off very ingeniously along the sides of hills, with an infinite number of roundings, which shows that those people, as unpolished as they were, very well understood the art of levelling. There is something indicative of no little art in the floating gardens and fields which were on the lake of Mexico. The cultivation of their fields, considering it was done by humna, without the aid of animal, labour was remarkable, and their produce surprising. The following passage from Gareillasso de la Nega deserves to be quoted as a monument of the labours of the Peruvians in agriculture. They drained all wet moors and fens, for in that art they were excellent, as is apparent by their works which remains unto this day; and also that they were very ingenious in making aqueducts for carrying water into dry and scorched lands."—(He explains how careful they were to water both their corn-land and pasture.) "After they had made a provision of water, the next thing was to dress, and cultivate, and clear their fields of bushes and trees; and that they might with most advantage receive the water, they made them in a quadrangular form; those lands which were good on the side of hills, they levelled by certain alleys or walks which they made. To make these alleys they raised three walls of friezed stone, one before, and one of each side, somewhat inclining inwards, so that they may more securely bear and keep up the weight of the earth, which is pressed and rammed down by them, until it be raised to the height of the wall. Then next to this walk they make another, something shorter and less, kept up in the same manner with its wall; until at length they came to take in the whole hill, levelling it by degrees in fashion of a ladder, one alley above the other. When the ground was stoney, they gathered up the stones, and covered the barren soil with fresh earth to make their levels, that so no part of the ground might be lost. The first quadrangles were the largest, and as spacious as the situation of the place could bear, some being of that length and breadth as were capable to receive a hundred, some two hundred, some three hundred bushels of seed. Those of the second row were made rather narrower and shorter. In some places they brought the channels of water from fifteen to twenty leagues distance, though it were only to improve a slip of a few acres of land, which was esteemed good corn ground." The Mercurio Peruiano describes extensive works of irrigation among the Peruvians, of which

the vestiges are still to be seen. Acosta, tells us (Nat. and Mor. Hist.) "The Indians do draw from the floods, that run from the mountains to the valleys and plains, many great brooks to water their lands, which they usually do with such industry, as there are no better in Murcia, nor at Millan itself, the which is also the greatest and only wealth of the plains of Peru, and of many other parts of the India. The country of the Seiks, a people confessedly barbarous, a well informed author—(Franklin, in his Memoirs of George Thomas) informs us, is highly cultivated, and their arts and manufactures are on a level with those of any part of Indus. The Tartars of Daghistan have a custom which they carefully observe; which is, that no person can marry among them before he has planted in a place marked out one hundred fruit trees; so that there is found every where in the mountains of Daghistan, large forests of fruit trees.

#### THE CEREUS AND CACTUS.

WHEN many of the succulent plants which are now honoured with strange names were considered to belong to the great family of Cacti, we had *Cactus speciosus*, *Cactus speciosissimus*, *Cactus Jenkinsonia*, *Cactus grandiflorus*, and others equally well known and grown as Cacti, but the everlasting itching which botanists have for changing names and dividing families, has formed, we know not how many, families out of this one genus, and old fashioned people have to learn over again the names of half their collections. On one occasion there was rather an unworthy trick played at the Horticultural Gardens, with respect to an exhibition of six plants of different genera, when these new divisions answered the purpose of one person at the expense of others, he having put up *Cactus Jenkinsonia*, and *Cactus speciosissimus*, for two different genera, much to the annoyance of those who exhibited more valuable but less gaudy plants, no one but the favoured showman having ventured to put up more than one of that family. It was then held in behalf of the fortunate exhibitor, that one was *Cactus speciosissimus*, and the other was *Cereus Jenkinsonia*. If we are to take a modern work for an authority we shall find that even *speciosissimus* is placed in the genus *Cereus*, for we there find *Cereus speciosissimus*, *Cereus flagiformes*, *Cereus grandiflorus*, and *Cereus senilis* side by side, as if these changes were to be periodical, and people were never to be long together right, in their catalogues or their conclusions. Then again, as if one species of humbug was only to cover another, we find all the family gathered together under the natural order *Cac-*

*taceæ*. Now, all this seems very uncalled for to us, who think once learning a thing quite trouble enough, but were it not for these constant changes, there might be some difficulty in making the science subservient to the wants of regular professors. Whether we give the whole family under the name of Cacti as a genus, and the various distinct classes of plants as species, or take the new barbarism of natural orders into keeping, calling the large family *Cactaceæ*, and the numerous species genera, matters little so far as our present purpose is concerned, but inasmuch as we cannot adopt a single natural order without countenancing some of the most silly assumptions we prefer the former, and therefore in treating of them, we shall notice only those leading characteristics which distinguish the principal species. Nature seems to have divided them into groups, very easily understood. The tree Cacti which comprise *Speciosus*, *Speciosissimus*, *Serpentarius*, *Truncatus*, *Grandiflorus*, and all their varieties, which by intermixing and hybridizing seem endless, may form one group. The Melo Cacti or melon shape Cacti, seem very distinct as a group. The *Mamalaria* or Cacti with protuberances all over them, in the form of teats, whence the learned name-givers seem to derive the excuse, for thus designating them, are in turn very distant, though varied a good deal. Then comes the Echino Cacti or Porcupine Cacti, which are covered with strong horny prickles. There are other groups equally distinct, and which, when we have more time and space we may devote a few sheets to, but it is sufficient for the present purpose to say, that there are Cacti which grown in extremely odd forms, and some which are properly called *Cactus Monstrosus*, growing like rockwork, others which are without any recognized form, some with triangular stems, others with octagon, some with broad prickly leaves, called *Opuntia*, but all capable, from some peculiarity, of arrangement in groups. These wonderful plants, for wonderful they are in their structure and habit now form the subject of great emulation among collectors, for they have many advantages. To begin, they are almost as easy to cultivate in perfection as any tribe of plants at present known. Secondly, they are always interesting, because, though their bloom is in some instances beautiful, and always curious, the plants from their peculiar growth are the real object of attraction.— Thirdly, they take but little room, for except the *Opuntia* and tree Cacti, they are by no means spreading, when there is room for the pots there is room for the plants, for the melon shaped, porcupine, and mamalaria, in all their varieties are peculiarly interesting, and

are now the most attractive and take less room.



THYMUS AZUREUM.

THIS little dwarf plant is one of the many species which are adapted for rock work, and it will grow well in common peat. There is nothing striking in it and the same may be said of most rock plants, they are well adapted for the purposes for which they are cultivated; for a tall plant on rock-work would destroy the features of the place, though there are many that would succeed. *Thymus azureum* has a purple or violet coloured flower, a short bushy habit, continues a considerable period in bloom, and greatly assists in making up a variety in all places where dwarf plants are required. The great use of these dwarf plants is that they flourish where there is but little sustenance, among stones and bad ground, where the soil is shallow and poor, and they propagate easily from seed or by parting the roots.

#### THE PALMS.

Part of a Lecture by Professor Johnson.

THE Palms, were not only very useful in the economy of man, but likewise the tribe consisted of the most majestic plants that the vegetable kingdom could furnish. A few of them were arborescent, being of low growth, or a very few feet in elevation, whilst others attained the height of the tallest forest trees. At the summit of the stem there was always a tuft of leaves thrown out, which, when once observed, would always be known. It consisted of long stalks, which might be mistaken for branches, which were always doubled up like a fan; and this was important as distinguishing the tribe from the tree-like ferns, which threw out at the summit a little tuft of

leaves, the central of which were curved inwards. Generally speaking, the plants are uni-sexual, and hence they are said to be male and female; the shorter flowers are the male, and the taller ones female, and the taller produce nuts, whilst the males are immature. These never assume high colours, being generally of a reddish tinge, and the parts are always disposed of three or its multiples. There are six stamens, and the pistil is composed of three distinct portions, these numbers always prevailing throughout the flower. The fruit of the palm differs, in some being like a berry, and in others like a nut, as in the fleshy food of the date or the fibrous matter of the cocoa. The flowers are small, and are remarkable for the enormous quantity in which they are developed. A single branch of the date palm is estimated to produce 12,000 flowers; and in one species called the alphonsum, every branch produces 207,000 flowers, or as there are three flowering branches on the tree, one of these produce upwards of 600,000 flowers. The Sejee palm produces about 8000 fruit upon every flowering branch. There is a great diversity in their habitats; some are low and others very high, but one peculiarity in their being confined to tropical lands, none being found in temperate climates. The curve of the top is a very peculiar character, and the leaves are very large contrasted with the height and dimensions of the stem. In one called the umbrella palm, the leaves are capable of covering between twenty or thirty persons, and are used as tents by native Indian armies, who carry them for their encampments. The loftiest are often 200 feet in height, and they are remarkable in their mode of growth, as endogenous plants, or those which grow from intensity of thickness, and distinct from the oxogenous, or those which grow externally. The mode of growth, or that of pushing the new matter into the interior, causes the limited duration of this class of plants; for others which deposit or grow outwardly, would not appear as if they had any limits, whilst those which cannot break or yield beyond a certain extent, have a limited period to their growth, and a check to the deposit of new matter, as when this cannot pass down the plant it must die. Even in palms that grow to a height of 200 feet and upwards, every year a new tuft forms at the top, and all the old parts die away, the base of the new bud sending down new roots to take nourishment from the soil. So long as the matter is sufficiently soft, the buds will go on developing; but when it becomes hard, so that they cannot pass down, then the growth will cease. When the plant has reached this height, and the stem is too hard for farther growth, the bud develops an enormous

bunch of flowers, the fruit ripens and is scattered, and in the effort the tree dies: it no longer lives when it has disseminated the means for future existence. Similar laws to this apply throughout the whole vegetable kingdom; and in the gardens and orchards we practice the same, by starving plants which do not produce flowers; cramping them in their growth, keeping them short of water, &c. It generally happens that the terminal bud is developed, as the leaf bud, from the axils or bases of the lower leaves; and this is necessary to give the straight direction to the stem. Some species throw out forks, as the Doon palm in Egypt, which is almost unique. With a slight exception, the palms are tropical plants; but there is one met with in our greenhouses, under the name of the dwarf tan palm, which is met with on the shores of the Mediterranean, in 43 deg. N. lat. In New Zealand they are met with in as cold a climate as 38 deg., but they are chiefly met with between the parallels of 30 deg. N. and S. of the equator, where they form food, clothing, habitations, and even weapons for the inhabitants.

The history of trees which prove the support of so many thousands, is necessarily interesting, and the most prominent, those which produce the date and the cocoa-nut, are well known in England. When eaten as a luxury after a solid European meal, or to pamper a luscious appetite, persons are little aware of how many millions subsist wholly upon them, and relish them with simple water. The countries of Barbary, Egypt, Persia, and Arabia, form the line where the date is the principal support of human life. There, poets have praised it, and lawyers and princes cultivated it. A forest of dates is in those countries a magazine for the cities. So great is the quantity produced by one tree, that it is calculated to bear from one to three cwt. of dates annually; they commence bearing fruit at eight or ten years of age, and three or four generations may subsist upon one tree. But it is not only used as a necessary of life; for the Arabs obtain from the date tree a dessert for their tables. A very great luxury is obtained by making a conserve from the fruit; and the sap is converted into a spirit to satisfy the depraved appetites of the children of Ishmael, but this is only obtained by destroying the tree, hollows being scooped at the top, from which, for about six weeks or two months, is obtained about two or three pints each week. The suckers which the trees throw up, and which form great impediments in passing through the forests, are used as food, being boiled and eaten as our common culinary cabbage. The leaves are used for bedding, baskets, and mats; and the hard and stony mass of the seed, being ground into pow-



der, forms no inconsiderable part of the food of the camel. Almost all the economical arts of life are in fact concentrated in this tree. It is also worthy of notice, that dates afforded the first instance of the difference of sexes in trees; for, although they were cultivated without a knowledge of these distinctions, their practical effect was carefully attended to. It is always usual in their plantations to hang the flowering branches of the male date over the bearing one, to obviate the effects of any circumstances that might operate against their natural development. It was always the practice, likewise, to preserve, even for years, branches of the male flowers, in case of accident, as where the existence of persons almost entirely depended upon them it was necessary to provide against any natural contingency. The term palm was applied by the Romans more specifically to the date palm tree. The city of Zenobia was afterwards called Palmyra, from the number of date palms with which it was surrounded; and they always looked to places in which these trees abounded, in order to fix the site of their cities. The Arabic name of Cadmor in the Desert, or the Tadmor of Scriptural language, exhibit the same.

The next of this class in utility, but beyond it in distribution, and of almost equal value in the economy of man, is the cocoa-tree. A warm temperature is necessary for its development, but its dominion encircles the whole globe. The seed is essentially a navigator, from the fibrous, light, and buoyant nature of the texture which surrounds it. It is quite at home on the sands, and in all the islands in the tropics where it grows is found even on the verges of the sands. The word is spelt *coco*, or without the final *a*, by the Portuguese, which is their name for monkey; this being given to it by the early navigators, from the supposed resemblance of the three dark spots on it, to the face of this animal. The Arabs boast of their date-palm, and that it can be applied to 360 purposes; and the cocoa-nut tree can be applied to an almost equal number. When not quite ripe, the nut contains milk, which, when fully ripened, consolidates with the fibre of the kernel, from which, by expression, an oil is obtained, which has latterly been much used in this country as fuel for lamps. The interior shell is converted into drinking-cups, and the external fibre of the fruit is a substance which may be employed for many purposes, like hemp. The outside fibre of the tree is employed in fences, and as fuel, and in burning, forms abundance of potash; the middle ribs are used as oars; and the fibres, too, form a net-work, which is used by Indian mothers as cradles for their children. The centre of the tree is edible and nutritious, and the outer part make

swords, knives, and cutting instruments, while the tree divested of the inside, forms drums. From the sap is made toddy, and when the former is boiled, it makes sugar, which, when fermented, is converted into the well known liquor called arrack. These are but a small portion of its uses, which are parallel to those of the date, and its importance is well known as characteristic of others of the tribe. Amongst other productions must be noticed sago, the soft edible centre of many, but chiefly to those of the sagus tribe, so called from its tessellated covering. The pith of the trunk is the part used, which, being triturated in mortars, and rubbed in sieves, is brought to that state in which it is known in commerce. The well known resinous substance known as dragon's blood, exudes from another species by incision, and perhaps the difference in colour, in many specimens, is attributable to the degree of ripeness of the tree. Another species, known by the name of calamus, is used for walking-sticks, and from the trunks of others wax exudes spontaneously. The areca, or far-famed beetle-nut, is obtained from the areca catechu, a remarkable exception to a family so much used for food, as being very astringent, and from which the well-known astringent catechu is obtained. Another variety is the cabbage-tree of the West Indies, so called from its terminal bud, which is cooked, and considered a very pleasing luxury. Its height is from 180 to 200 feet or more, and this terminal bud is the only part that can be eaten. The fruit differs very much in the several varieties, but no well-defined permanent division has been established; and although it is one of the most natural that the vegetable kingdom presents, the ordinary subdivisions are not good. One curious fact connected with them, is their very limited mode of growth. Humboldt states, that he found a new species of palm in every degree that he traversed, so limited and restricted are they to different parts of the earth. One of the most singular cases that can be instanced, is that of the double cocoa-nut, so remarkable from their growth being confined to two small islands, called the Seychelles Islands, in the Indian Archipelago. They are not known to grow in any other part of the world, and before the locality of their growth was discovered, were long since found floating in the Indian Seas, and even on the continent of India, and from which they were called the sea cocoa-nut. Their place of growth was, in fact, not known until the English explored these islands; but some very curious tales were, and are still, related of them. They grow from twelve to eighteen inches in diameter, and have a thick fibrous coat, the colonel embryo being

hard and horny, and the nut for a long time resisting putrefaction. The Malay and Chinese sailors say that they grow upon a tree, which, with its fruit, is seen in slow water; but that, when any person dives down to them, the trees immediately disappear. The negro priests say that they grow upon a submarine tree near Java, and that a large bird roosts in its branches, which comes occasionally on shore, and even devours elephants. But this is not the whole of his power: as the motion below would keep ships near the spot, when the bird used to make the mariners an easy prey. In the Maldivian Islands, the penalty of death was inflicted upon any one keeping possession of one of the fruit, as, from their being much esteemed, they were always the exclusive property of the king. Their value was from 60 to 120 crowns, and if a foot in diameter, at least 150 crowns; and so much higher have they been esteemed, that a ship's cargo has been given for one of them, so great has been their value as regal presents. Like other rare vegetable productions, to them has been ascribed the power of being a preventive to all manner of diseases, and particularly against poisons; and the shells were made into drinking-cups, it being supposed that if any poison were drank out of them, their effects would be neutralized. Their efficacy was also strongly reputed in inflammatory diseases, apoplexy, and paralysis, and equal to that of animal magnetism, or any of the nostrums of the present day; whilst they had probably more effect, as the faith of the people was stronger. This tree only grows in the interior of two islands, whilst the sea-coast is covered with cocoa-nut trees, and is an instance of the limited habitat of the palm tribe, confirming Humboldt in what he said of those which he met with in another hemisphere.

#### HORTICULTURE AND AGRICULTURE OF HINDUSTAN, ETC.

In considering the progress of the Hindus in agriculture, we must bear in mind, that though the most important of all the useful arts, it is not the first invented, nor the first which arrives at perfection. It is allowed, on all hands, that the agriculture of Hindustan is rude; but the progress of agriculture depends so much on the laws relating to landed property, that the state of this art may continue very low, in a country where other arts are carried to a high degree of perfection.

A Hindu field, in the highest state of cultivation, is described to be only so far changed by the plough, as to afford a scanty supply of mould for covering the seed; while the useless and hurtful vegetation is so far from be-

ing eradicated, that, where burning precedes not, which for a short time smooths the surface, the grasses and shrubs, which have bid defiance to the plough, cover a large portion of the surface.

Nothing can exceed the rudeness and inefficiency of the Hindu implements of agriculture. The plough consists of a few pieces of wood, put together with less adaptation to the end in view, than has been elsewhere found amongst some of the rudest nations. It has not any contrivance for turning over the mould; and the share, having neither width nor depth, is incapable of stirring the soil. The operation of ploughing is described by the expressive term, *scratching*. Several ploughs follow one another, all to deepen the same furrow; a second ploughing of the same sort is performed across the first; and very often a third, and a fourth, in different directions, before so much as an appearance of mould is obtained for the seed.\*

The instrument employed as a harrow is described as literally a branch of a tree: in some places as a log of wood, performing the office partly of a roller, partly of a harrow; and in others, as a thing resembling a ladder, of about eighteen feet in length, drawn by four bullocks, and guided by two men, who stand upon the instrument to increase its weight. The Hackery, which answers the purpose of cart or waggon, is a vehicle with two wheels, which are not three feet in diameter, and are, not unfrequently, solid pieces of wood, with only a hole in the middle for the axle-tree. The body of the machine is composed of two bamboos, meeting together at an angle between the necks of the two bullocks, by which the vehicle is drawn, and united by a few crossing bars of the same useful material. It is supported at the angle by a bar, which passes over the necks of the two animals, and cruelly galls them. To lessen the friction between the wheel and axis, and save either his wretched cattle, or his own ears, the simple expedient of greasing his wheels never suggested itself to the mind of a Ryot of Hindustan.† Even

\* You frequently see a field, after one ploughing, appear as green as before; only a few scratches are perceptible, here and there, more resembling the digging of a mole than the work of the plough.—Tennant Ind. Recr. ii., 78.

† You cannot by any means prevail on the listless owner to save his ears, his cattle, or his cart, by lubricating it with oil. Neither his industry, his invention, nor his purse would admit of this, even though you could remove what is generally insurmountable—his veneration for ancient adage. If his forefathers drove a screeching Hackery, posterity will not dare to violate the sanctity of custom by departing from their example. This is one instance of a thousand in which the inveterate prejudices of the Asiatics stand in the way of their improvement, and bid defiance equally to the exertions of the active, and the hopes of the be-

this wretched vehicle can seldom be employed for the purposes of husbandry, from the almost total want of roads. It is in back loads that the carriage of almost all the commodities of the country is performed; and in many places the manure is conveyed to the fields in baskets, on the backs of the women.†

Every thing which savours of ingenuity—even the most natural results of common observation and good sense—are foreign to the agriculture of the Hindus. The advantages arising from observation of the fittest season for sowing are almost entirely neglected. No attention was ever paid in Hindustan to the variety of the grains, so as to select the best seed, or the fittest for particular situations. For restoring fruitfulness to a field that is exhausted, no other expedient is known, than suspending its cultivation, when the weeds, with which it is always plentifully stored, usurp undivided dominion. Any such refinement as a fallow, or a rotation of crops, is far beyond the reach of a Hindu. The most irrational practice that ever found existence in the agriculture of any nation, is general in that of India, that of sowing various species of seeds, mustard, flax, barley, wheat, millet, maize, and many others, which ripen at different intervals, all indiscriminately on the same spot. As soon as the earliest of the crops is mature, the reapers are sent into the field, who pick out the stalks of the plant which is ripe, and tread down the rest with their feet. This operation is repeated, as each part of the product arrives at maturity, till the whole is separated from the ground.

Though, during the dry season, there is an almost total failure of vegetables for the support of cattle, of which every year many are lost by famine, and the remainder reduced to the most deplorable state of emaciation and weakness; none but the most imperfect means were ever used by the Hindu of saving part of the produce of the prolific season, to supply the wants of the barren one. Hay is a commodity which it would not always be convenient to make; but various kinds of pulse

and millet might be produced at all seasons, and would afford the most important relief to the cattle when the pasture grounds are bare. The horses are often preserved alive by the grooms picking up the roots of the grass with a knife from the ditches and tanks.

After describing the wretched state of agriculture in the neighbourhood of Seringapatam, Dr. Buchanan, in a "Journey through Mysore," says, "I am afraid, however, that the reader, in perusing the foregoing accounts, will have formed an opinion of the native agriculture still more favourable than it deserves. I have been obliged to use the English words, ploughings, weeding, and hoeings, to express operations somewhat similar, that are performed by the natives; and the frequent repetitions of these, mentioned in the accounts taken from the cultivators, might induce the reader to imagine that the ground was well wrought, and kept remarkably clean. Quite the reverse, however, is the truth. Owing to the extreme imperfection of their implements, and want of strength in their cattle, a field, after six or eight ploughings, has numerous small bushes remaining as upright in it as before the labour, while the plough has not penetrated above three inches deep, and has turned over no part of the soil. The plough has neither coulter nor mould board, to divide and to turn over the soil; and the handle gives the ploughman very little power to command its direction. The other instruments are equally imperfect, and are more rudely formed, than it was possible for my draughtsman to represent. On every field there is more grass than corn; notwithstanding the many ploughings the fields are full of grass roots. In "Robertson's America," we find agriculture was almost universal among the American tribes. Throughout all America, we scarcely meet with any nation of hunters which does not practice some species of cultivation. The agriculture of the Peruvians was apparently superior to that of the Hindus.

The only circumstance to captivate the fancy of the Europeans, who were on the look out for subjects of praise, was the contrivance for irrigation. Reservoirs or excavations, known in India by the name of tanks, were so contrived as to collect a large body of water in the rainy season, whence it was drawn off in the season of drought, for refreshment of the fields. These tanks appear to have been at all times a principal concern of the government; and when it is considered, that almost the whole revenue of the sovereign depended, in each year, on the produce of the soil, and that the decay of the tanks ensured the decay of the revenue, it is no wonder that of such care and wisdom as the government any where

nevolent.—Tennant Ind. Recr. ii., 75, 76. This characteristic of a rude people, a blind opposition to innovation, is displayed by persons among ourselves, as if it was the highest mark of wisdom and virtue. The waggon wheels are one piece of solid timber, like a mill-stone.—Tavernier in Harris, i., 815.

† Into Oude are imported a variety of articles of commerce from the northern mountains, gold, copper, lead, musk, cow-tails, honey, pomegranate seeds, grapes, dried ginger, pepper, red wood, tincas, civit, zedoary, wax, woollen cloths, wooden ware, and various species of hawks, amber, rock salt, assafetida, glass toys. What is carried back is earthenwares. All this commerce is carried upon the backs of men, or horses and goats.—Ayren Akberry, ii., 33. Buchanan's Journey, i., 205, 434. Capt. Hardwicke, in Asiat. Reg., vi., 330.

displayed, a large portion should appear to have been bestowed on the tanks. In certain places, much care and labour have been bestowed. But those authors were strangely mistaken who looked on this as a proof of refined agriculture and great civilization. It is only in a small number of instances, where the whole power of an extensive government, and that almost always Mahomedan, had been applied to the works of irrigation, that they are found on a considerable scale, or in any but the rudest state. In a country in which, without artificial watering, the crops would always be lost, the ingenuity of sinking a hole in the ground, to reserve a supply of water, need not be considered as great.

To separate the grain from the straw, the ancient method of treading with oxen has, in Hindustan, given way to no improvement; and, for the most part, the corn is still ground in hand-mills by the women.

#### GARDENS OF MEXICO.

"AND here, (Mexico) also, they beheld those fairy islands of flowers, overshadowed occasionally by trees of considerable size, rising and falling with the gentle undulations of the billows." Here again, they found fresh cause for admiration in the grandeur of the city, and the superior style of its architecture. The dwellings of the poorer classes were, indeed, chiefly of reeds and mud. But the great avenue through which they were now marching was lined with the houses of the nobles, who were encouraged by the Emperor to make the capital their residence. They were built of a red porous stone, drawn from quarries in the neighbourhood, and, though they rarely rose to a second story, often covered a large space of ground. The flat roofs *azoteas*, were protected by stone parapets, so that every house was a fortress. Sometimes these roofs resembled parterres of flowers, so thickly were they covered with them, but more frequently these were cultivated in broad terraced gardens, laid out between the edifices. Occasionally a great square or market-place intervened, surrounded its porticoes of stone and stucco; or a pyramidal temple reared its colossal bulk, crowned with its tapering sanctuaries, and altars blazing with inextinguishable fires. The great street facing the southern causeway, unlike most others in the place, was wide, and extended some miles in nearly a straight line, as before noticed, through the centre of the city. A spectator standing at one end of it, as his eye ranged along the deep vista of temples, terraces, and gardens, might clearly discern the other, with the blue mountains in the distance, which, in the transparent atmosphere of the

table-land, seemed almost in contact with the buildings. As they (the Spaniards) passed down the spacious street, the troops repeatedly traversed bridges suspended above canals, along which they saw the Indian barks gliding swiftly with their little cargoes of fruits and vegetables for the markets, &c.

"The *Chinampas*, that archipelago of wandering islands, have, also, nearly disappeared. These had their origin in the detached masses of earth, which, loosening from the shores, were still held together by fibrous roots, with which they were penetrated. The primitive Aztecs, in their poverty of land, availed themselves of the hint thus afforded by nature. They constructed rafts of reeds, rushes, and other fibrous materials, which, tightly knit together, formed a sufficient basis for the sediment that they drew up from the bottom of the lake. Gradually islands were formed, two or three hundred feet in length, and three or four feet in depth, with a rich stimulated soil, on which the economical Indian raised his vegetables and flowers for the markets of Tenochtitlan. Some of these *Chinampas* were even firm enough to allow the growth of small trees, and to sustain a hut for the residence of the person who had the charge of it, who with a long pole, resting on the sides or bottom of the shallow basin, could change the position of his little territory at pleasure, which, with its rich freight of vegetable stores, was seen moving like some enchanted island over the water.\* How gay and picturesque must have been the aspect in those days with its shining cities, and flowering islets, rocking, as it were, at anchor on the fair bosom of its waters.

The gardens of Huaxtepec are thus described:—The Spanish General "Sandoval took up his quarters in the dwelling of the lord of the place, surrounded by gardens, which rivalled those of Iztapalapan in magnificence, and surpassed them in extent. They are said to have been two leagues in circumference, having pleasure houses, and numerous tanks stocked with various kinds of fish, and they were embellished with trees, shrubs, and plants, native and exotic, some selected for their beauty and fragrance, others for their medicinal properties. They were scientifically arranged; and the whole the establishment displayed a horticultural taste and knowledge, of which it would not have been easy to find a counterpart at that day in the more civilized communities of Europe.† Such is the testimony not only of the rude conquerors, but of men of science,

\* Humbolt, tom. ii. p. 87, et seq. Clavigero Stor. del Messico, tom. ii. p. 163.

† Rel. Terc, ap. Lorenzana, pp. 221, 222. Bernal Diaz is not less explanatic in his admiration.

who visited these beautiful repositories in the day of their glory.†

"But the best wealth of the first settlers was in the vegetable productions of the soil, whether indigenous, or introduced from abroad by the wise economy of Cortés. He had earnestly recommended the crown to require all vessels coming to the country to bring over a certain quantity of seeds and plants. He made it a condition of the grants of land on the plateau, that the proprietor of every estate should plant a specified number of vines in it. He further stipulated, that no one should get a clear title to his estate, until he had occupied it eight years. He knew that permanent residence could alone create that interest in the soil which would lead to its efficient culture; and that the opposite system had caused the impoverishment of the best plantations in the islands. His various regulations, some of them not a little distasteful to the colonists, augmented the agricultural resources of the country by the addition of the most important European grains and other vegetables, for which the diversified climate of New Spain was admirably adapted. The sugar-cane was transplanted from the neighbouring islands to the lower level of the country, and, together with indigo, cotton, and cochineal, formed a more desirable staple for the colony than its precious metals. Under the sun of the tropics, the peach, the almond, the orange, the vine, and the olive, before unknown there, flourished in the gardens of the table-land, at an elevation twice as great as that at which the clouds are suspended in summer above our heads. The importation of a European fruit or vegetable was hailed by the simple colonists with delight. The first produce of the exotic was celebrated by a festival, and the guests greeted each other, as on the appearance of an old familiar friend, who called up the remembrance of the past, and the tender associations of their native land.

In 1530, Cortés revisited Mexico, and ultimately took up his residence in the city of Cuernavaca. It was the place won by his own sword from the Aztecs, previous to the siege of Mexico. It stood on the southern slope of the Cordilleras, and overlooked a wide expanse of country, the fairest and most flourishing portion of his own domain. He had erected a stately palace on the spot, and henceforth made

this city his favourite residence. It was well situated for superintending his vast estates, and he now devoted himself to bring them into proper cultivation. He introduced the sugar-cane from Cuba, and it grew luxuriantly in the rich soil of the neighbouring lowlands. He imported large numbers of Merino sheep and other cattle, which found abundant pastures in the country around Tehuantepec. His lands were thickly sprinkled with groves of mulberry trees, which furnished nourishment for the silk-worm. He encouraged the cultivation of hemp and flax, and by his judicious and enterprising husbandry, showed the capacity of the soil for the culture of vegetable products, before unknown in the land; and he turned these products to the best account, by the erection of sugar-mills, and other works for the manufacture of the raw material. He thus laid the foundation of an opulence for his family, as substantial, if not as speedy, as that derived from the mines. Yet this latter source of wealth was not neglected by him."

#### PRUNING FRUIT-TREES.

It is a general complaint that all directions for pruning are so prolix, that they are difficult to be understood, even by those of experience in that branch. To remedy these defects I shall use my utmost endeavours to render this treatise as plain and easy as possible. There are many things materially necessary to be considered besides pruning, in order to have healthful trees, without which it is impossible to have good flavoured fruit. There are gardens that produce fine fruit of a high flavour, and others contiguous to them, whose fruit are not much superior to crabs in relish, although managed (as to pruning) both exactly after the same method. This difference of flavour is generally attributed to the situation but never to the soil, from a supposition that there is little difference. A good situation is certainly of great advantage to the flavour of fruit; but if the soil is improper, though ever so skilfully pruned, the fruit will not be high flavoured, although often fair and beautiful to the eye. The general method in making the borders in kitchen gardens is to make them rich, without regard to the different kinds of fruit to be planted in them. When thus prepared the trees will often thrive, look well, and produce great quantities of fruit; but it will be very inferior in flavour to the fruit of those trees that are planted in soils which are properly adapted for them. To remedy this evil I shall give directions for making the borders fit for all kinds of fruit; and to render this easy, it will be proper to plant a good many of the same sort together, and not pro-

† The distinguished naturalist, Hernandez, has frequent occasion to notice this garden, which furnished him with many specimens for his great work. It had the good fortune to be preserved after the Conquest, when particular attention was given to its medicinal plants, for the use of a great hospital established in the neighbourhood.—See Clavigero *Stor del Messico*, tom. iii. 153.

miscuously, which is the general practice; for if they are promiscuously planted, it will be difficult to prepare the borders properly; in that case there must be a change in the preparation every five or six yards. In small gardens, where there is only room for a few trees, perhaps one or two of a kind, it will be easy to prepare the borders at first; but difficult to keep so many parcels of compost for recruiting them: when that happens, to prevent trouble, all the borders may be made of two sorts, viz. for peaches and cherries, which will answer well, and is the best way where a gardener is not kept. In large gardens, where there is a large collection of fruit-trees, the preparation answers for the same kind of fruit in all aspects. There must always be a quantity of each sort of the compost ready prepared, to lay on the borders every third or fourth year; this will keep the trees many years in good heart, and the fruit will be very high flavoured. It will be of great advantage to the compost for the borders to be turned over three or four times in a year, and to be two years old before it is used. It will add greatly to its fertility to be turned over in winter when it is hard frozen, and all the frozen parts turned into the inside; it should not be turned when covered with snow, unless it is swept clean.

Having now given directions for the management of the compost, before I proceed any further, I shall give general directions for planting all kinds of fruit-trees, on walls, dwarfs, and espaliers, in borders and orchards.

Wall-trees should never be planted nearer the wall at the bottom than nine inches; if they are planted so close, for the bole to press against the wall, it often gums and cankers them. The proper distances being marked on the wall (which should be ascertained for each kind of fruit) open a hole a foot square, and sixteen inches deep, in which lay a flat stone at least two inches thick, and on the stone three inches of the mould prepared for planting. The roots of the tree must be pruned so as to stand sloping on the mould laid on the stone, the head inclining to the wall; fill up the hole with the planting mould, and tread it gently; then loosen it an inch deep with the spade, after treading it. Cover eighteen inches round the bell of the tree with moss, two inches thick, pressing it flat with the hand; fasten the tree to the wall with a single nail and shread, to prevent its being shaken with the wind, but so loose that the tree may not hang by the shread if the ground should chance to sink. There is nothing further necessary, until they are headed down in spring, which should never be done before the buds begin to swell. The trees for walls are generally brought from some distant nursery, and are some days out of the ground;

for which reason all the small roots must be cut close off the main roots, and these properly shortened, and never left crossing one another. It is preferable for all kinds of wall-trees to have but one stem to be young and vigorous. If the ground is tolerably dry in autumn (after the leaves are fallen) the sooner fruit-trees are planted the better; but if the bottom is of a cold watery nature, the spring is preferable. If the trees to be planted are on the spot, they may be removed with safety, although the leaves are fresh: when that is the case, there is no occasion to cut off any of the small roots; but if they are out of the ground a day, the small roots dry, the bark shrivels, and the tree often decays, for which reason it is best to let the leaves drop before the trees are removed to a distance. Clean moss is preferable to all kinds of straw or dung to lay round newly planted trees; it breeds no vermin, and keeps out the frost and drought: great care must be taken not to bring grubs with it from the field, for it is often pulled up in great pieces, in which there are many: it would be worth the labour to lease it all over before it is laid round the trees. The planting of dwarfs or espaliers in the borders of kitchen-gardens, the making of the holes, and laying the flat stones, is the same as for wall-trees, but there is some difference in the manner of pruning the roots. In pruning the roots of wall-trees, those on the side next the wall should be all cut off, as there is no occasion for any but those that point from the wall, but for dwarfs or espaliers the case is quite different; the roots should be cut to spread as regular as possible all round, that they may be able to defend the tree, let the wind blow from what quarter it will. If the trees for dwarfs or espaliers are planted in autumn, it would be best to fasten them to a stake, and head them down in spring. A wet bottom is very bad for a kitchen-garden, especially to all kinds of trees; for although some of them may thrive tolerably well, and bear a great quantity of fruit, it is never good, if the soil is prepared with all the art imaginable. Espaliers are now banished all good gardens, for many reasons: if the trees are on paradise-stocks, they are of short duration, and often decaying in patches, which makes them very unsightly. If on stocks, unless they are allowed a great deal of room to spread and to grow to six feet high, they require so much cutting to keep them in order, that they seldom produce much fruit. When the espaliers are allowed to grow high, unless the quarters of cause the herbage to draw up weak, it is then the kitchen-garden are large, in summer they never so good, nor so well tasted as when it has free air. Espaliers are also stiff and formal, and spoil that agreeable rural look of trees

growing in the natural way. Apples on French paradise-stocks, planted at eight or nine feet distance, pruned and kept in an easy manner, make a fine appearance, and produce better fruit, and in greater quantities, than when they are in espaliers. Trees planted and trained thus, admit free air into the quarters; and the little openings give a view into them which is pleasant to those that delight to walk in a kitchen-garden. If the kitchen-garden is large, the trees on the south-side of the quarters, behind the north wall, the inside of the garden, may be planted with apples on Dutch paradise-stocks, and allowed to grow as high as the wall; it will be very agreeable in summer: they last much longer than the French-stocks, and will bear more and finer fruit; the French paradise-stocks are apt to canker, but if the walks are good earth, the same as the borders, they will not be so liable to that misfortune. To prevent any unsightly trees in the borders, round the quarters, it would be right to have a few spare ones growing in a corner of the garden, which might be taken up with a hole, and put into the place of any tree that is cankered or decaying. If the tree that is taken up is not far gone, it may be planted in some bye place; moving often stops the canker. The only objection to training dwarfs in this manner is, that the fruit is more liable to be blown off than from espaliers; if the first shoots are trained horizontal for two years, they will grow stiff, and will not be much hurt by the strongest winds. This manner of training will also answer for common orchards, the fruit will be much easier to gather, and not to be so subject to be blown off by the wind, as when the trees are high: it may be objected, that the cattle would crop the lower branches. The laying flags at the bottom of all fruit-trees is good in all kinds of soil. If the roots are dressed, and the trees planted as directed, they will never go lower, but spread horizontally; they will continue many years, and bear excellent fruit. It is recommended by some, and the practice of many, to lay a quantity of rubbish in the bottom of borders, to prevent the roots getting down into clay, sand, or gravel: this never answers; the roots will strike into the rubbish, and even through it, if a foot thick, into the sand, &c., but as soon as the roots reach the rubbish, the tree cankers and the fruit spots. The roots of fruit-trees should not be above one foot deep in the ground, for the soil below that is hard, dry, and full of rancid vapours, even in good soil. The nourishment the roots draw from thence spoils the rich flavour that those fruits have whose roots are no deeper than the air and rains penetrate. It is the general opinion that old trees cannot bear good fruit on account of their age; this

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is seldom the case; the reason indeed is, all the small roots are spread too deep into sand, gravel, or clay; hence they canker, and the fruit is spotted. Apples on crab-stocks will last many years, and bear good fruit. An instance of this I saw in the ruins of a monastery which had been in the same family ever since its dissolution, and by tradition the same trees that were in the place when it first came into their hands some hundred years ago. The trees were much decayed, but what were alive of them bore fair round fruit, equal except as to size to any tree of ten years old. The whole orchard was paved with bricks; the soil twenty inches deep, a fine rich loam. There was a plantation of pear-trees about thirty years old; which had covered the wall some years, and produced great quantities of fine fruit; at last they began to canker, and the fruit to pit: they became every year worse. But the following experiment brought them to flourish again: The ground was opened all round the bole of the tree at three feet distance; the roots were cut off all round at that distance; the bole thinned to the thickness of two feet, a stone put under it, and the whole filled up with a good fresh loam. This was performed in winter; it was late in spring before they came into leaf. They made no shoots, and the few small leaves they had soon decayed: they had some water in the summer. This is a proof of the great utility of preventing the roots from striking too deep into the ground. Next spring they were in leaf as soon as any of the same kind, made little wood, but clean, and had some fruit, which was fair and clean. The third year they were as vigorous as when first planted, quite clear of canker, and produced a great quantity of fine fruit. Having given directions for planting, with some reasons for what has been said on that head, we shall now proceed to prepare the borders for each kind of fruit, adapting the soils that will preserve the trees healthy, and bring the fruit to its utmost perfection in size and flavour. The soil and situation should be considered in fixing on a spot for a kitchen-garden, for if there is not a foot or more of good soil the expense will be immense, if the garden is only of a moderate size. The best natural soil for a garden is a light loam, and where eighteen inches deep of such a soil can be got the expense will be trifling.

#### CULTURE OF TOBACCO AND HOME MADE CIGARS.

It is well known that many gardeners cultivate Tobacco for the purposes of the forcing departments, and the culture shall be describ-

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ed in a future article. Some object to home-grown tobacco, considering it weak; and so it is, compared with rank "shag;" but it is equally certain, that the leaves of the large Virginian, with pink flowers, and those of a variety with white flowers, recently introduced, may be brought to great perfection in a light, rich, sandy soil, with a full exposure to the sun. These leaves have been successfully employed against the green fly for several years: but they may be most economically used in preparing domestic cigars, provided the drying be skilfully conducted. We shall now describe our own process—leaving ourselves open to correction. The leaves grow from a foot to eighteen or twenty inches in length, and are frequently more than six inches broad: they should be gathered just as the flower-buds begin to separate, prior the blossom expanding. The midribs of each being pared off level with the leaf through its whole length, the leaves are suspended across a line in a warm stove or vinery; an open airy shed will do, if well exposed to the sun. When they become flaccid, and their colour changes to a dingy yellow, they are placed on a board, one on another, as flat and level as possible, till the pile be several inches deep. Another board is then laid upon the pile, and pressed by weights; a good screw-press would be a great improvement. If the bulk be considerable, a degree of fermentation takes place, and a slight heat is developed: these induce a rapid change, similar to that which results from the heating of a hay-rick: the raw odour goes off, and that of true tobacco is formed. When this becomes perceptible, the mass is divided into several thinner portions, which are slowly dried in a half-cooled brick bread-oven. There are certain salts, one of which is nitre, revealed during the curing of Tobacco, which attract moisture; when, therefore, the dry and brittle leaves are taken from the oven, and placed in the atmosphere of a moist stove, they speedily again become flaccid, and in this state the leaves are separated, and laid in a long narrow box, and sprinkled one by one with the least possible quantity of a powder consisting of saltpetre, (nitre) and salt of steel (refined copperas, *i. e.* sulphate of iron), rubbed till intimately united in a stone ware mortar. By this application, which may be given with a soft brush, and thus made to extend over the whole leaf, colour is given, and the smouldering quality of tinder imparted. The flavour and odour are also much assisted by scattering between every dozen of leaves, a few shreds of the superior foreign leaf tobacco, or of the best Dutch 'cnaster. The whole stock of leaves being thus placed in the box, a weighted board is laid over them. If the

crop be gathered in fine sunny weather during September, and carefully prepared, the leaves will be in prime condition by the following March; though we have found improvement from longer keeping. In manufacturing home-made cigars, the process of rolling, and adapting the smaller fragments, so that nothing be lost, can be most effectually learned by taking two or three soft foreign cigars to pieces, and carefully observing the order in which the different parts are arranged. A flat rolling board may be of use, and also a little gum-water, to cause the outermost coiled edges to adhere, but they are not indispensable. For fumigation, a sprinkling of the strongest shag between the leaves will answer every purpose, and one ounce will suffice for two pounds.

#### AUTUMNAL GRAFTING.

THERE are two ways in which knowledge may be diffused: one, and the most direct, is by the communication of facts, confirmed by ably conducted experiments, the results of which admit of no doubt. The second, far less decisive, but perhaps equally if not more useful, is the recital of experiments in the course of progress, grounded either upon observation or communication from others, and undertaken with the express view of ascertaining a fact, or prove the validity of a theory. Man's life is too short, individually, and his powers are too limited to permit him to undertake, or prove much: he therefore, is compelled to appeal to others—to call upon coadjutors, for conjoint, and simultaneous efforts. I have been in the habit of thus anticipating discovery; preferring rather to incur the charge of writing on a subject prematurely, than to retain, selfishly, an idea, which might conduce to the extension of true science, and useful practice. I act upon this principle now, for I freely confess that I am not assured of the correctness of the statement which I shall briefly communicate.

A gentleman of great erudition, while viewing some of my grafted trees, late in July last, made the remark that "the grafting season was at hand." I enquired what he meant, and was told that, "in September the trees (he was credibly assured) would take grafts with complete success." I had never heard of the practice, and embraced every opportunity to make enquiries, among those whom, I was certain, must possess correct information. Not any gardener could speak to the point; the answers were to the following effect:—"Such a thing may be, but we know nothing of it." One youth only, of reading and observation, seemed to pause:—"I don't



know!—the success must result from the effect of the descending sap." Such was the spirit of his remark; and it is to be hoped that hundreds of young men among the rising generation, could now be found, who so think, and reflect. I immediately procured grafts of the *Beurre D'Aremberg* pear; and without waiting for September, placed them, each with three buds, and the leaves cut in half, in small quince stocks, by the "rind," or "crown grafting." I also tried Coe's plum, a nonpareil apple, a calabasse pear, and a *Cydonia Japonica*, the last on a quince, at subsequent periods. The two *beurres*, retained the short-

ened leaves, green and fresh for above fourteen days; then, on being lightly touched, these leaves exfoliated perfectly, leaving the cicatrice clear, and the buds full. Yesterday, September 16, I examined the grafts, and found them perfectly sound, and, to all appearance, as healthy as any twig of the size could be after the fall of the leaf. I am not quite so well satisfied with those subsequently tried; nor am I sure of the entire success of any: time must afford the proof." This experiment was tried by Mr. Towers, who has since proved it to answer, and Mr. Carlisle of Romford confirms it.



MARANTA ZEBRINA.

THIS is one of the stove plants which every body must grow in such a building if they pretend to get together a selection; it is grown for its splendid foliage, its bloom is a bunch of confused flowers of no beauty, and therefore not valued, the leaves are of a velvety green, rather shaded and richly striped with a black, or a green so dark as to look black.

It requires the stove heat at all times of the year, and to be handsome should be shifted as often as the pot is completely filled with roots, for unless kept growing, the leaves will split and become discoloured. It is one of the few plants that are worth growing for their leaves only, for they are always handsome in form, and exceedingly graceful.

#### DEPTH AT WHICH SEEDS SHOULD BE DEPOSITED IN THE SOIL.

THE due depth at which seed should be deposited in the soil is a very important subject, which has been ably discussed by Baron Voght, of Flotbeck, near Hamburg, and an ingenious comment has been made on his paper by Mr. Main. If seeds be placed, by accident or design, at such a depth in the earth as to be out of the influence of the air, and though they may be surrounded by the requisite degrees of heat and moisture, they will, nevertheless, remain dormant. We may have instances of the truth of this in everyday practice, and of the imperishable properties of some kinds of seed, when excluded from the influence of the air. If seeds are

dropped on the bare surface of the ground, they will remain uninjured and unaltered, so long as the air is perfectly dry; but, in moist air, germination commences, and the point of the root will quickly be protruded, and find its way into the soil. This is the ordinary process of nature; but experience has taught us, that, though nature distributes grain and other seeds generally on the surface of the spot where produced, yet, there is a proper depth at which all seeds should be deposited, and which is specially suitable. This depth is, obviously, that which, while it yields the necessary degrees of heat, moisture, and darkness, is yet within the requisite influence of

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air. In the ordinary proceedings of farmers, in the business of sowing, our implements, more than anything else, regulate the depth at which we lay in the seed. The drilling system is approved, and not only from its equal distribution of the seed, but because, by it, seeds are, also, laid in at an equal depth; this last circumstance being regarded as one of the principal advantages of the machine. Now, our author has endeavoured to shew, that seeds may be deposited too deep, even by the drill; and in all cases, when seed is sown before harrowing, much of it will be laid deeper than it should be. Of this there can be no doubt. Every one acquainted with sowing must allow, that seed may be buried; and every body acquainted with the structure of culmiferous plants, and their manner of growth, must be convinced, by what the Baron has shewn, that, if seeds are but just covered, so as to be sufficiently shaded from the sun's rays, it is enough. As proof of this, our author quotes several eminent authorities, who argue from the physical structure of the plants, as well as from the qualities contained in the seed, and which submit to the chemical action of the elements in the act of germination, that deep sowing is highly detrimental, and opposed to the provisions of nature. Explanatory of these assertions, the Baron has appended to his paper, figures of five different kinds of corn, in five different states of growth, caused by the different depths at which they have been deposited in the earth. The last of these being the deepest, vegetated, although two or three inches under the surface: threw out its seminal or first roots, and sent up its first shoot, bearing two leaves into the air; but, as the first joint of the culm rises therewith, and remains near the surface, it also throws out roots, and entirely supersedes those that were first produced from the grain. Now, as this is only a provision of nature, to accommodate herself to circumstances of accidental position, many cultivators have been of opinion, that the placing of the seed at irregular depths makes but little or no difference to the ultimate strength of the plant, or to the crop. To this the Baron is decidedly averse, affirming, that this unnecessary waste of vegetable power is both hurtful and unnatural. We think, and indeed we may venture to say we know, that he is right; for, without mentioning the needless waste of vigour, the young plant must be more liable to accidents, from the changes of the weather, slugs and insects, during the ascent of the first shoot, and before the principal roots are formed, than if it started from its natural position at once. To guard against over deep sowing, therefore, the Baron advises to sow nothing before harrowing; and,

moreover, that great pains should be taken to pulverize the surface with fine harrows, before the seed is sown, lest the corn should rise in rows, which, in broadcast husbandry, he condemns. Very different this from the custom of sowing wheat in this country, where the dexterity of the ploughman is often judged of, by the regular exactness in which the ranks of corn appear on first coming up. This idea of the Baron's, though it be condemnatory of the drilling system (unless the machine be made to deliver very thinly), is, notwithstanding, very reasonable. The numbers of inferior ears, and the inequality of our samples of wheat, is mainly owing to the plants being too much crowded in the dips between the furrows. Admitting that the principle of shallow sowing and equal distribution on a well-harrowed surface is, in general, right, still as we have in this country very often a showery seed-time, it would be running a great risk on a clayey soil, to harrow it down so finely as Baron Voght advises; and, if a naturally loose and dry one, such an operation would, probably, bring up such a crop of weeds as would greatly injure, if not destroy, the crop. But, on early sowed fallows, all kinds of lent corns and small seeds, we think, from what we know of the nature of seeds, generally, as well as from this writer's opinions, that the farmer cannot do wrong in following the Flobeck manner of sowing broadcast.

#### LABOURS OF EARLY BOTANISTS.

Few people are aware of the vast and adventurous labours of those earlier botanists, who were truly pilgrims on earth, visiting the shrines of nature in every accessible region of the globe, and from thence collecting the knowledge which not only extended, but cleared and beautified the field of their favourite science, for the enjoyment of posterity. We will endeavour to give a brief sketch of one or two, whose history, as foreigners, may be less known in this country. Joseph Pitton de Tournefort, a native of Provence, was born in 1656. He was destined for the church; but his father dying before the time arrived for his ordination, he devoted himself to botany, a passion for which he had secretly indulged from a child. His first visit was to the mountains of Dauphiné and Savoy; and, after two years study at Montpellier, to Catalonia, the Pyrenees, and the Alps, taking Languedoc and Provence in his way. The next two years he passed in arranging and classing the plants he had collected. He was then appointed Botanical Professor in the Jardin des Plantes, at Paris. Between this period and 1791, he explored Spain (2nd time), Portugal, England,

and Holland. He now set about preparing his discoveries for the press, and published his *Elements of Botany*, in 1694, and his history of plants growing near Paris in 1698. In 1700 he set out upon no less an expedition than exploring a large portion of Asia and Africa. We have no space to recount the dangers and difficulties he encountered; nor even to follow him, step by step, in his wanderings. Crete, the islands of the Archipelago, the shores of the Black Sea, Trebizond, Erzeroom, the banks of the Euphrates, the mountains of Armenia, Georgia, and Mount Ararat, were his rout in Asia, outwards; and the plague raging in Egypt, alone deterred him from taking an equal stretch into Africa as he returned. The expedition cost him two years; and, as the fruits of it, he brought home no less than 1336 species of plants. The remaining six years of his life were spent in preparing the account of his tour for publication, but an accidental death cut him off in robust and vigorous manhood, at the age of fifty-two. His great Asiatic work was, therefore, a posthumous one. Frederick Hasselquist, a native of Sweden, was born in 1722. In youth, in manhood, and even in the grave, his name was associated with poverty and its distresses; and though, at the same time, constitutionally consumptive, nothing could repress his ardour for botanical research. In 1749, with a slender purse, and weak health, he sailed for Asia; visited the islands of Milo, Scio, and Smyrna, and thence proceeded to Anatolia, to explore its mountains and ravines. He next bent his footsteps to Alexandria, Rosetta, Cairo, the country about Gizeh, and Damietta. From Damietta, he sailed for the Holy Land, which he industriously explored; and proceeded by the ruins of Tyre, to examine the vast gardens of the city of Sidon. Cyprus was his next destination, and thence he returned to Smyrna, by Rhodes, carrying with him an incredible number of curiosities which he had collected in Egypt and the Levant. Three years of such toil and privation, however, were too much for such a constitution. He died at Smyrna; and, having borrowed 150*l.* in the East, his collections and papers were seized for the debt. His friend Linnæus was then too poor to redeem them; but the Queen of Sweden generously supplied the funds, and Linnæus had shortly the satisfaction of editing the MSS. of one of the most worthy and laborious, and unfortunate children of science.

#### ON GROWING ACHIMENES.

FROM a long article on this subject, in the *Botanical Magazine* for the month of October, we select a few passages that may be interesting

to our readers, as well as give them an idea of the manner in which practical subjects are treated in that work. It is well known that the slender stems of *A. longiflora* are unable to support themselves with the weight of their leaves and flowers, in an upright position. To obviate this, many resort to the expedient of employing a multitude of sticks, and tying out each shoot separately. *There is, perhaps, no way in which a really beautiful plant can be more injudiciously treated, for what is really elegant and pleasing in itself is thus rendered stiff and unnatural.* Besides, it is almost impossible that the sticks can be concealed by the foliage, and when they stand so glaringly and conspicuously, they are still more exceptionable. If supports are to be employed, they ought by all means to be well concealed, and the plants loosely and skillfully attached to them; so that whilst they are effectual in giving support, a stiff, constrained, or a bundled appearance may not be produced. What has been said of *A. longiflora* may also be applied to *A. pedunculata*, and *A. hirsuta*, with almost equal propriety. These species are of a taller growth, and though much more robust than the first, they are, nevertheless, too frail to maintain an upright posture without aid. There is also a disposition to elongate rather more than is desirable, as the flowers are thus placed too widely apart. Hitherto, pot-culture has been almost the exclusive practice: but, whilst we acknowledge the excellency which has already attended it, and its superior suitability as a general method, we may yet question the propriety of confining ourselves wholly to it. A few deviations from ordinary usage, judiciously introduced, are always pleasing in the additional variety they afford. The slender stems of *Achimenes* hang so gracefully when unconstrained by the confinement of sticks, that a basket in which they might be grown and suspended, would seem more suitable, and there are few things more delightful or enlivening than a number of graceful forms hanging from the roof of a house, when the plants so treated manifest a willingness to accommodate themselves to the circumstances. We have repeatedly seen the old *A. coccinea*—better known, perhaps, as *Cyrella pulchella*—treated in this style; and, though it does not thrive with equal luxuriance to that which may be reached when grown in a pot, the deficiency in that respect is fully atoned for in the increased profusion and richness of the blossoms, and in the loose and graceful posture. *A. longiflora* yields with similar readiness to this treatment, and experiment will, doubtless, prove it to be equally congenial to others.

GROWING THEM IN BASKETS. — Perhaps

the most eligible kind of basket for growing them in, is the hemispherical one generally used for *Stanhopeas*. But for the sake of additional variety many other forms may be employed, models for which may be observed in almost every extensive collection of Orchidaceæ. Blocks of wood will, probably, be found approvable, where the roots can be enveloped in a moderate casing of moss. The baskets may either be filled entirely with moss, in which they root pretty well, or the centre may be filled with an open fibrous soil, and a layer of moss placed round the outside to prevent it from washing away. But a better method will be to fill the basket with a very fibrous peat, as free as possible from small, fine earthy particles. A well-decomposed swarth from a common, grows them admirably; indeed, they are far from difficult to suit in the medium for the roots. When they can be procured, the old decayed root-stocks of Ferns, such as *Aspidiums*, will be a very appropriate material.

There are many other ways of growing this admirable plant; such as against the wall of a hothouse, like orchideous plants, in the open ground, and otherwise, but there is nothing novel in the practice.

#### PREPARATION OF STRAWBERRIES FOR FORCING.

At this season of the year (written in July), the plants will send forward abundance of those runners, which, at certain distances from the parent stock, develop little plants, that take root, and in many instances become strong enough to bear an abundant crop of fruit during the following spring. It is this fact which has laid the foundation of one of the methods very commonly in practice among gardeners, of obtaining plants in pots for the production of strawberries in the months of March, April, and May. The amateur gardener, for whom alone these observations are penned, simple as the operations may appear, will probably be hampered by unforeseen difficulties during his early experiments; I, therefore, will endeavour to smooth his way, by the recital of a few plain facts. The first caution to be observed, is in the choice of a good and fruitful parent; for, it appears that barrenness may be as readily propagated and extended, as fertility, in the vine as well as the strawberry. Let, then, the sort termed Keene's Seedling be chosen—not altogether for flavour, it being inferior therein to the Old Pine,—but for its precocity; and on no account, let one runner exist which springs from a barren parent, be that ever so strong in appearance. Secondly—select the runners,

whose first formed plantlets appear strong and full in the centres; and as such are produced, treat them in the following way. Prepare a bushel or more of a compost of good maiden loam, with one fourth part of its *bulk* of black manure, from old linings that had been formed of leaves and stable-dung, in the ordinary manner for forcing. Incorporate these materials perfectly; and it would be better, were the mixture made a month or two in advance, turned and worked with a spade two or three times—Collect as many pots (60) from two to three inches across at the rims, as shall be wanted; put into them about one-third of their depth of fine coal ashes, and plunge each pot exactly within reach of the runner plant, which is to be potted in it. Fill the pot with the compost; press down the plant, so that the soil may reach the top of the string, and cover the base of the leaves; fasten the runner with a hooked peg, the shorter hook of which shall confine the rim of the pot as well as the string of the plant. Finally, lay a pebble on the part whence the leaves emerge; as this will serve the double purpose of pressing in the heel, and of retaining moisture around it. Give a good soaking of water, repeat the waterings, and watch attentively, the rooting of the plants. The sap from the parent will secure the vital action of the runner, which would fail under the least degree of drought, were it left to the support of its own inefficient germs of roots; and therefore it will always be advisable to let the union between the parent and offset plants remain till the pot be filled or well supplied with roots, which state can be ascertained by easing the peg, and lifting a pot. If any fibres pass the hole, it will be right to detach the runner, by cutting it close to the rim; and then a good watering should be given. In a day or two afterwards, the plant should be transferred to the fruiting pot, called a broad 32—which previously is to be prepared, by putting into the bottom a piece of crock, or oyster shell over the hole, then an inch of moss, or the fibrous masses from turfy loam; and upon these, as much of the same compost-loam first named, as will permit the plant, with its ball of soil entire, to drop to the depth of an inch below the rim of the pot. The ball being thus placed, fill up the space around it with the loam. Let every fibre be in close contact with the earth: but hard pressure need not be used. Instead of that, soak the soil to saturation, and then make the surface level, to within half an inch of the rim, with fine rich earth. Many persons put an inch layer of broken crocks or potsherds, instead of moss or fibres, as drainage; and if the pots finally stand in pans of water, it may be very pru-

dent to do so; but as my plan presumes a different method of treatment, I recommend a vegetable drainage. The plants once potted for good, are to be placed on tiles, or boards, or on a deep stratum of ashes, under a wall or close fence, *with a north aspect*; and the soil *must never become dry*. "Hic labor—hoc opus est." Herein will be found the diligence and forethought of the cultivator, who should see that his plants never flag. The pots must remain in a cool exposure till October: then, they are to be placed in full view of the sun, and so remain, till the season arrive for exciting the growth under glass. Some persons plunge the pots over the rims in a bed of sifted coal ashes, during the winter; and they thus preserve them from some degree of frost, and prevent the ingress of worms. Here, we have made it a sort of condition that Keene's seedling should be exclusively used. But this restriction must not be misunderstood; for the varieties known by the terms of—old pine, Myatt's new pine, Grove-end, Downton, and others, may each, and all be used; but the fact is, that unless heat be applied to a degree which may prejudicially affect the quantity and flavour of the fruit, such is the tardiness in ripening of the pine varieties, that the Keene's in the beds and borders would be ripe almost as soon as the pines, &c. under glass, leaving them comparatively valueless. Where fertility and an early supply are the desiderata, Keene's must be resorted to; but the pines may be procured at a comparatively early period by the process shortly to be noticed—in abundance, and with little, or no loss of flavour. It remains, however, to direct the amateur cultivator's attention to methods of pot preparation which some gardeners practise, differing from that already given. One of these is, about mid-September, to take up a quantity of well proved old plants, to detach some of the offsets (not runners) which adhere to the collar, securing a few white fibres to each, if possible, and to plant three of these cuttings in one pot, close to the side, in order to stimulate the protrusion of roots. The soil is to be a light rich loam, and as fast as the pots are planted they are to be copiously watered, placed on a stratum of ashes, in a perfectly shady situation, and the soil be kept moderately wet till growth be thoroughly established. This is a poor, doubtful, and unskilful mode of planting, and produces many weak and fruitless plants, to say nothing of the numbers which fail entirely in the first stage. A third method, and one which appears to be coming into vogue, precludes the necessity of potting twice—it consists in selecting, early in the year, the self-rooted runners of the previous

summer, and potting them at once, into thirty-twos, or twenty-fours. Not materially different in the practice of potting one-year old plants in April, which had produced a crop of fruit; in the latter case some keep the plants in pots one entire summer, to establish their roots thoroughly in the pots, before they are permitted to blossom. In any case it will be essential to choose plants with the largest central buds, and to take them up with good compact ball of roots to each. There is one great advantage in early spring potting; for plants may then be selected among the perfectly rooted runners of the summer which can scarcely fail to bear fruit. If the soil be open and rich, the roots carefully raised, and placed in close contact with the soil of the pot, and the plants immediately protected under glass in a cool frame there will be no loss of time; the growth will commence in a few days and proceed without interruption, that is, if the gardener do his duty; and attend to the due supply of air, water, and to the proper regulation of light. I am now arrived at the point which is the chief object of consideration. A common brick melon pit, of any dimensions, built with four-inch, nine-inch, solid or cellular work, as the case may be, is to be furnished with a bed of light, unctuous loam, the surface of which, after allowing due time for settling, should not be more than one foot below the glass of the lights, and at a corresponding slope. About the middle or latter end of September when the runners have become established plants, any required number of the fullest hearted of them should be carefully raised, and firmly planted in the soil of the pits, in regular rows from front to back, distant from ten inches to fifteen inches as under, according to the habit of growth of the variety chosen; the plants to stand about six inches apart in the rows. If older, proved plants, be preferred, such may be taken either at the season named or after the turn of the year; but the success will mainly depend upon the speedy adaptation of the roots to the soil; and, therefore, be the time of planting when it may, the lights must be placed on the frame, and kept closed till the firmness of the leaves gives proof of the activity of the roots. The mould should be in a free condition at first, and rather dry, than wet or cloddy, but water must be occasionally given, to secure uninterrupted growth. If September planting be adopted, the lights should be removed and kept off after the plants are secure, till the season for exciting come round, which will be determined by the time when ripe fruit is to be gathered. Experience must settle minutiae—for, if hot linings, or a flue be employed, strawberries can be had at almost any time after the first

of March; but the simple treatment I now keep in view premises no means of excitement beyond that of retained solar heat acting upon the atmosphere of the pit, and the enclosed body of soil. By these natural agents, fine and perfect fruit will be obtained during May or June, about one month in advance of the natural season, in the open air, which, of course, is always governed by the climate and weather.

#### ON SAVING FLAX-SEED.

FLAX is certainly a hazardous crop, being more liable to be injured in the several processes which it undergoes, before it is brought to market, than any other, and makes no return, under the present mode of cultivation, towards restoring the fertility of the soil on which it grows. Under these circumstances, it becomes an important enquiry—can its cultivation be rendered more profitable? Of this there can be little doubt, when we consider the great national as well as individual loss annually sustained by neglecting to save the seed. It has been proved by repeated trials, that seed saved in this country, when due pains have been taken, is not inferior to foreign seed, for which vast sums of money are paid to foreign states. It is, however, difficult to convince our flax growers of the truth of this; but let them give it a fair trial, and we have little doubt as to the result. It must, indeed, be admitted, that when seed is sown for a length of time on the land which produced it, a gradual deterioration will take place in the quality of the crop, but we surely have sufficient variety of soil in this country to prevent this casualty from taking place; at all events, if we are still to have importations of Flax-seed, it will be quite sufficient to change the seed every third or fourth year, instead of every year, as at present. But should the annual demand for foreign seed continue, sufficient encouragement is held out to induce the farmer to sow his Flax-seed by the high price which may at all times be obtained for it from the oil manufacturer, and it will be found both nutritious and palatable as food for live stock. When it is intended to sow the seed, it is usual to allow it to become a little riper than when this operation is not performed, but this is not essential to the success of the process when the seed is not intended for sowing. The quality of the seed will, however, be much improved by it, and the advantage gained in this way will more than make up for any loss sustained in the quality of the fabric. The Flax may, therefore, in every case be allowed to stand until the colour of the seed in the capsules of seed-vessels, provincially termed bolls,

is partially changed from white to brown. The Flax is sometimes laid in handfuls by the pullers, in order to facilitate the process of rippling, by saving those engaged in it the trouble of separating the Flax. It is also occasionally allowed to lie for some time on the ground, or, when tied up, to stand in the stook before rippling; but the utility of either of these practices is questionable, so far as any advantages gained by the seed is concerned, and is decidedly injurious with respect to the fibre. As soon, therefore, as the Flax is pulled, the operation of rippling may commence. Fine weather is, perhaps, as indispensable for this process, as for any other; indeed, in severe weather it can scarcely be attempted, for the bolls being succulent and wet, will speedily ferment when put together in considerable quantities. The ripple, which consists of a number of iron spikes placed in a block of stone, is placed in the field, and fixed on a beam of wood, on the ends of which two persons sit, who, by pulling the seed end of the Flax through the ripple or Flax—a second pull through the ripple will effect this object. The work will be considerably expedited by having boys or girls attending the rippers, to separate the Flax after it is rippled. The process is advantageous where the seed is of no value whatever, as the water is admitted more freely into the stock, thus facilitating the decomposition of the woody part, and the separation of the fibre. The bolls now having a tendency to heat, should not be allowed to accumulate, but immediately rippled, to separate any parts of the Flax that may have been broken off in rippling; and if they are put through a winnowing machine, it will separate the green leaves of the Flax, which would otherwise contribute to bring on a fermentation. Great care is required to prevent them from heating. For this purpose, the bolls are thinly spread over a boarded floor, in a situation to which a current of air has access, and repeatedly turned over. When the weather is fine, they should be exposed to the sun through the day, on a winnow-cloth, and brought into the house in the evening. When thoroughly dried, the bolls are thrashed or bruised with a wooden mallet, and the seed separated by winnowing. If it be kept any length of time, it is better not to separate the seed from the capsules. Should wet weather occur at this time, it will be necessary to kiln dry the capsules a little; but this should be done with a very moderate heat, otherwise the seed will be injured. When the seed is intended for sowing, the Flax is stooked up in the field, after pulling, and stacked, when completely dry, until the spring, when a slight threshing separates the seed from it, and it is then watered in the

usual manner. The quality of the fibre is injured by this process, but it is, perhaps, essential, in order to have seed of the best quality; however, there is little doubt but seed may be procured of a sufficiently good quality by the former method, when properly managed. The produce of seed from an acre will be from eight to twelve bushels. When it is not used for sowing, it is disposed of to oil manufacturers, or consumed by horses and cattle.

#### THE FOOD OF PLANTS.

THE *laboration of vegetable aliment*, or what may be expressed in plainer terms—the conversion of manure (*humus*) to sap, is the point at which we are now arrived. One author declares that “*humus* is insoluble in water,” and I am very willing to cede to this opinion, so far as applies to the absorption of manures by the organs of the plant; I also readily admit that, when those substances are ploughed into land not subjected to a crop, they remain in a great degree undecomposed. Manure, or *humus*, cannot, as such, enter into the vessels of any plant, whether as a solid or a fluid; nor can any colouring substances be absorbed by living *unmutilated* vegetables: all the experiments which have been undertaken with cuttings, or slips, are just so many delusions, and the results, fallacies. A plant implies an organized being, furnished with a perfect and undisturbed *system of roots*, an entire stem, or some corresponding part which connects the leaves with the roots, and those leaves with their appendages. If any one doubt the correctness of this opinion, he should plant a small young balsam, or some other vegetable with a very transparent stem, in a pot containing the most simple and unmanured soil; and, when its growth has been completely established, moisten the soil day after day with any coloured fluid:—such as, infusion of logwood, or red-cabbage, diluted ink, black manure water, or anything else that will support and enable the plant to grow. If the sap-vessels take up any portion of the colouring matter, it will become perfectly visible on dividing the stem, and investigating transverse and longitudinal slices by the aid of a good microscope; I have so often tried such experiments, that my own mind is made up on the subject, though it remains perfectly open to conviction of error, if any be philosophically proved to exist. Now, if cuttings of a balsam, or of any other juicy plant, be plunged for a few hours into coloured liquors, they quickly and copiously attract and exhibit the colouring matter; and thus, many most accurate observers have been deceived in their attempts to discover the conduits and course of the sap. Mutilations can,

in fact, never afford evidences of the functions of a living and entire plant when actuated by the *vital principle*. This may appear a repetition of what has been advanced before; but I would prefer to reiterate, rather than leave a particle of doubt respecting the predominating energy of the principle of life. The sap of a plant, that bland and tasteless fluid which is conveyed into the vessels by the organization of the roots, is the result of vegetable action upon the *humus* of the soil. But *humus* alone is inimical to vegetation: and a soil glutted with it, is so also, though in a way, and to a degree somewhat different. A due and proportionate balance between the *earths* and the *manure* must be observed; and when this exists, there appears to be a play of affinities between the vitality of the roots and the native *earths*, which might be compared to a galvanic action. By it the elements of the *humus* become *first* deranged, then, newly arranged in the form of sap, and attracted by the absorbent vessels of the roots. I would, then, with submission to the author of some notes on this subject, say, “*Humus* remains for a long time in the earth unimpaired, but no sooner is it brought into contact with”—the vital (electrical?) stimulus of the roots—“by the process of cultivation, than an action begins.” A part of it, by uniting with oxygen, may doubtless produce carbonic acid gas, and escape into the atmosphere; and in fact, we must refer to some such unfailing source, to enable us to account for the quantity of floating carbonic acid which is always found in atmospheric air; but to explain the production of *sap*, we must suppose that three of the elements of the *humus* (oxygen, hydrogen, and carbon,) are newly arranged, and thus converted to that peculiar fluid; for it is much more probable that, as the elements of carbon constitute the major part of the substance of all herbs and trees, the carbon enters the roots in unison with hydrogen and oxygen, rather than by absorption through the pores of the leaves. The author presumes that the residue becomes a soluble and absorbable extract; but in this I think there is an oversight, for the reason above assigned; and indeed, the very term of extract conveys an idea of a coloured *liquid*! but sap is colourless and nearly insipid, and may with strict propriety be deemed a production of vegetable energy, “wholly inimitable by man.” As the decomposition of manure proceeds, moisture is produced, and hence the great security against drought which attends the planting of vegetables in trenches, well supplied at the bottom with vegetable mould. But independently of sap, water, and carbonic acid, the *earthy* portions of the *humus* are either taken up in quantity and quality suited to the constitution of

the plants individually, or deposited in the soil. It is well known to chemists, that substances combine more readily as they are formed, or developed (in their *nascent* state); and therefore, as manures contain *all* the elements of vegetable bodies, these elements are seized and arranged exactly in the proportion required during the process of decomposition. Every individual vegetable thus elaborates a sap precisely suitable to itself; and this view of the subject interprets in the most simple and conclusive manner the mysterious introduction of chalk, alum, silex, iron, &c., into the vegetable vessels. Solar electricity appears to be the stimulating *principle*, the radical system of plants the *machinery*, and the manure the *subject* to be acted upon. It has been before observed, that the pure earths are not decomposed; they are the staple of the land; but manuring substances are entirely decomposable; they are resolved first, into a black carbonized mass, the basis of *humus*; this substance as we have seen—contains all the elements of vegetable beings; it is then simple and natural to conclude, that by the final decomposition of this *humus* under the influence of vegetable action, all that constitutes a plant are given forth, and absorbed. Such of the earthy portions of the *humus* which any plant may require, it takes up: thus, potatoes and tobacco abound in chalk, which must have been attracted by the roots, and received by them in the form of solution. Wheat abounds with flint, and the silex of the *humus* is therefore dissolved by the peculiar action of the roots of the wheat plant. Whatever of earth is not essential to a vegetable remains in the soil, and thus adds to the staple. The decomposition and resolution of manures in this way, are seen to produce most surprising and beautiful phenomena; plants are nourished, the *earths* are maintained, but the *manure* vanishes. Upon this principle we may arrive at another conclusion; namely, that land, be its natural quality what it may, is not changed by manures. He, therefore, who wishes to improve the staple, must not hope to do so by the application of manure; *earths* can be meliorated by *earths* only, and this doctrine accords with the opinion of the writer so often referred to: "In very light soils *humus* is seldom found in any quantity, being too much exposed to the air and rapidly decomposed. Such soils are very unprofitable, until they are improved by clay or marl." By the scientific melioration of the staple earths, we procure a certain foundation for the prosperity of every future operation.

#### HINTS TO AMATEURS.

THE florist who loves his Tulips, as well as the

tyro who is going to begin growing them, must now look about him. There never was a time when he could be supplied with good things so cheap; there never was a period when those who have stocks would go farther to encourage those who have not. Often have we said that a Tulip bed, and the stage belonging to it, form one of the most charming objects in a well kept garden; and it is the niggardness of the owners, and not the assumed dislike to the flower, that prevents every good establishment from having it. A bed of Tulips is one of the most gorgeous displays that floriculture produces. Roses are sweet; Auriculas are delicate; Carnations are grand; Ranunculuses are neat; all flowers have their peculiar charms, but the Tulip bed is a galaxy of grandeur. No matter who comes within sight of it, or how much the spectator may condemn the Tulip as seen bobbing about its head in a border, the bed is admired as a noble object, and the rich who affect to think but little, while they evidently admire it, are only deterred from ornamenting their grounds with a collection, because it would cost them more money than they have the spirit to lay out. Tulip growers are only found among men and women of real taste—persons in whom the organ of order is predominant. A bed of Tulips is formed, and the more formal the planting the better. Our plan for growing Tulips, is to have three duplicate flowers in every row of seven, the centre one invariably of the same class as the outsiders, and a bed of Tulips so planted, is generally superior to the careless mixed plan, or absence of plan, which some cultivators adopt, when the organ of order is not so remarkable. Mr. Strong grew a bed of Tulips with a sort of ambition to excel in growth all others of his brother cultivators. He had no notion of order, beyond the planting at proper distances, whether three or four Roses, byblomens or bizarres, came together or not, was a matter of indifference. So, also, in his judgment of a flower, the breeder colour was no blemish in his eyes, whether the six petals all differed, or were all alike, whether they were scratched all over with colour, or had only a feather on the edge, was of small consequence; size, and high colouring were his delight, but there are others who wish when they stand at one end of a bed, to see uniformity from beginning to end, who desire to see a flower with all six petals alike. We wish, if there is a bizarre in the middle, to see the same variety of byblomen on each side of it, and next to those the same variety of Rose, and outside of all the same variety of bizarre. For instance, say Dickson's Duke of Devonshire in the middle, Louis XVI. on each side, Rose



Camuse next to those, and Strong's King outside. The second row must have a Rose in the middle; in this case, bizarres must be next to it, byblomens next to the bizarres, and Roses outside, as thus—Compte de Virginius in the middle, Polyphemus on each side, Reine de Sheba next to those, and Ponceau tres Blanc outside: the third row must have, according to our arrangement, a byblomen in the middle, Roses on each side, bizarres next to those, and byblomen outside, as thus—Siam in the middle, Rose Blanc each side. Gloria Mundi next, and David outside. This plan would be well represented by the figures 1, 2, and 3, repeating Rose, byblomen, and bizarre thus—

1	3	2	1	2	3	1
2	1	3	2	3	1	2
3	2	1	3	1	2	3

And so we might go on through a whole bed, by which plan the uniformity and beauty of a bed are increased twentyfold. The amateur must now look over his boxes carefully, and at his book, to see what the faults were at the last bloom; whether any require turning out, &c., being foul, or wrong, or too small; he should also examine whether any came up split into too small pieces to bloom again: and if he have Tulips enough, he should begin to arrange, after the fashion we have mentioned, by merely making duplicates where they can, and notching the flower as well as they can where they have no duplicates. No delay should take place in buying what is required. In Floriculture, as in some other matters, it is "first come, first served," and the earlier a bed of Tulips is ordered, the better will they be for the money. Lawrence, of Hampton; Groom, of Clapham; Brown, of Slough; Holmes, of Bethnal-green; are ready and willing to meet beginners more than half-way: that is, set them up for a trifle. Those who require particular flowers to make up their beds, have no time to lose. If the bed has to be made new, dig it out two feet deep, and if you have enough fresh loam to fill it up with, do so; but, if not, turn over the stuff you have dug out, or if the lower half of it is bad gravelly, or some stuff use only the top spit, and rob some other part of your garden for another spit to fill it up with, but so long as you turn over the stuff once or twice a week it is improving, and the end of the month will be time enough to return it to the bed. Get your outer beds ready as soon as you can and plant out the offsets (and the bulbs which you do not want), plant also the breeders. If you have any layers of Carnations or Piccotees

not potted in their winter pots, lose no time in doing it. Slugs will be looking after and attacking your Polyantheses, and Pansies; keep a sharp look out for them, or they will be troublesome. Auriculas may be put into their winter quarter for the sake of being protected from heavy rains which fall in autumn, but they ought not to be closed, or even have their glasses on in mild weather. If your Dahlias are to remain on the ground to bloom, as long as they will flower, remember that a discontinuance of watering allows them to decline in everything, the size and quantity of flowers, and of the petals in the flowers; but where the plant has done its work, it should be earthed up six inches up the stem at least, it will preserve them from sudden frost and throw off the wet. If they are to continue blooming you must continue watering, and litter round the roots will be useful. When the plants have begun to decline, and the leaves are turning yellow, it would be as well to put the spade under the root and lift it, laying the plant on its side as if it were in by the heels, but with the roots well covered against frost. Cuttings of China Roses might be planted very close in pots of sand and mould and put into cold frames or greenhouses, anywhere, out of the way; they must be kept moist all the winter, that is to say, they must not be allowed to dry up. Choice Verbenas and Petunias, in the open ground, should be taken up and potted, being cut back pretty close, and the cuttings may be put in as thick and as carelessly as the China Roses, with every chance of rooting if they are not dried up. So Geraniums, which are really wanted; and Fuchsias should be potted, cut back, and protected in a frame or house. Ranunculuses for early bloom—generally only common ones—and Anemones should be planted out in borders, clumps, and beds. The Hyacinths intended for beds should be planted, and others potted and glassed for blooming in houses, or forcing. Bulbs, which suffer from drying while out of ground, should be quickly removed from one place to another, or, if to be procured, should be got immediately and planted. We allude to Fritillarias and scaly rooted Lilies, but we must save for them hints for another time.—*From the Gardeners' Gazette.*

#### VARIETIES.

**NEW POTATO CULTURE.**—A Kirkmichael farmer, at the potato planting time, reserved a drill or two, which he sowed out, neither with cuttings or entire roots, but with potato *chuns* or sproutings; and during the summer the stems from this novel seed were vigorous beyond those in all the other drills, and, when

lifted in autumn, the roots—which had sprung, it may be said, from worthless rubbish—were thick in the ground, large in size, and of superior quality. Our informant confesses that he fell into the experiment merely from the dictates of fancy, and without either theory or practice to guide him; but from the splendid product of the useless chuns, he now regrets that the experiment had not been a more extensive one. As it was, these thumping roots were carefully preserved over the winter for seed, are now rushing up free from the shadow of faint, and give promise of by far the best crop upon the farm. To suppose that this mode of potato culture, however well it may have succeeded in one instance, should ever get into general use, or fairly supplant the other, is of course out of the question. But this experiment distinctly informs us that these chuns or sproutings contain the strength of the potato, and that as a necessary consequence, one excellent plan to maintain the seed sound and vigorous, is to preserve it from sprouting.

**TURNIPS.**—In a series of papers upon insects, injurious to vegetables, which have been supplied by Mr. James Duncan, he alludes to a farmer in Fifeshire, whose name has escaped our memory, who has hit upon a plan of preparing the turnip seed, which effectually preserves it from the ravages of the fly. It is simply this:—A short period before sowing, mix the seed well with the flowers of brimstone or sulphur, and sow both together in the drill. The turnip-devil or musquito seems to entertain as great an aversion for sulphur as unreclaimed sinners do; and while it will not attack the young blades of the root, these are not at all injured by the commingling of the foreign substance, but grow luxuriantly after it; at least so says the Fife farmer, who has successfully practiced this simple precaution for many years.

**EXTRAORDINARY PRODUCE.**—The following is the weight of some pines, raised in the pinery of the Rev. J. C. Read, of Frickley Hall, cut during one month. They are all of the "Providence" species, and the perfection to which they are brought reflects much credit upon Job Boothroyd, the gardener:—Cut July 3rd one of 7lb. 4oz., and one 6lb. 14oz.; July 6th, one 7lb. 12oz., one 7lb. 5oz., one 8lb. 2oz. one 8lb. 11oz.; July 11th, one 6lb. 5oz.; the 19th, one 6lb. 12oz.; the 23rd, one 6lb. 10oz. one 6lb. 11oz., one 7lb., one 6lb. 13oz., one 6lb. 13oz., and one 7lb. 12.; July 24th, one 9lb. Total weight 109lb. 12oz. This is not like one or two accidental large pines, but all good.

**AUCUBA JAPONICA.**—This shrub was, I believe, introduced into this country in the year 1783, as a green-house plant, but it now appears (and correctly) in the "Hortus Britan-

nicus," as a hardy shrub. It is so well known to nurserymen, and to men of my own profession, that it will not be necessary that I should give a minute description of it. I may only remark that it is an evergreen, with the leaf of a dark green, finely relieved by spots, and an edging of yellow, and is one of the best specimens of shrubs for ornamental plantations with which I am acquainted. It flourishes best in shady situations, and succeeds well under deciduous trees; and is thus peculiarly well adapted for underwood in common plantations, and favours an excellent shelter and protection to game, where this is an object, with this additional advantage, that it appears not to be subject to the attacks of hares and rabbits, so destructive to the holly and other shrubs. It is much superior to the *Rhododendron*, a plant much valued for the purpose alluded to, especially in Lancashire, where the soil in many districts, being of a peaty nature, is well adapted for its growth; but the *Aucuba* will grow luxuriantly in almost every description of soil, provided it will be well shaded by trees, or otherwise. It is consequently a plant well worthy of the special notice of nurserymen as well as the country gentleman who possesses a taste for rural improvement, and who takes an active interest in the embellishment of his grounds and plantations. It is with the greatest confidence I recommend the plant in question, as twenty years' experience has convinced me that it is one of our hardiest evergreens; for whilst most of our evergreens have sustained an injury, less or more, when exposed to severe frost, which was the case last winter, the *Aucuba Japonica* has sustained none whatever. I may further add, that this plant can be propagated with facility from cuttings, inasmuch as when it is put under a hand-glass, with proper management, you may calculate upon a plant from each cutting. The present is the best season for cuttings.—T. F. Sep. 29, 1844.

**PRESERVATION OF CORN.**—General Demarcay has proposed a new method, which is deserving the attention of English agriculturists. Thinking that all granaries were but imperfect shelters from the vicissitudes of weather, he has made use of an ice-house situated on his estate, but no longer used as such. Its depth was sufficient to render it impervious to atmospherical changes, and he lined it with wooden planks, so as to form a large case, but which was at some little distance from the bottom and sides of the ice-house, so that it was not liable to the damp of the surrounding earth, and allowed a free circulation of air round its exterior. The corn was placed so as to fill the case to within a yard of the top; three layers of loose planks

were placed at a third of a yard distance between each, and the roof was then formed of thatch, and in a conical shape. The experiment has lasted twelve years, and been constantly attended with satisfactory results. The same grain has remained there for three years, without the slightest alteration; and what is remarkable, some newly threshed corn, which had been completely wetted while it was measured in the open air, having been placed in the case, was, three weeks afterwards, found to be as dry and glossy as flaxseed. M. Libri states that this place has a striking analogy to the means proposed by Father Castelli, one of the most illustrious disciples of Galileo, who published his suggestions in Bologna in 1669, in a work which he called "*Opusculæ Philosophiques*."

**NITROGEN FROM GROWING PLANTS.**—In a paper read the Royal Society, by Robert Rigg, Esq., is contained an interesting enquiry into the influence and importance of nitrogen in vegetable physiology. All the experiments and observations on the subject tend to prove that nitrogen is evolved during the healthy performance of the functions of plants. The proportion which it bears to the oxygen given off is influenced by the sun's rays, but that owing to the necessary exclusion of the external atmosphere, during the progress of the experiments, it is impossible, with any degree of accuracy, to calculate the volume of these evolved gases during any period of the growth of plants in their natural state. If to this indefinite quantity of nitrogen given off by plants there be added that definite volume incorporated into their substance, and shown in the author's former table, the question arises, whence do plants derive their nitrogen, and does any part of it proceed from the atmosphere? A problem which the author proposes to solve by a series of tabulated experiments upon seeds and seedling plants, indicating a large excess of nitrogen in the latter, and under such circumstances of growth that he is compelled to fix upon the atmosphere as its source. By the same mode of experimenting, the author attempts to show that the differences which we find in the germination of seeds, and the growth of plants in the shade and sunshine, are apparently due in a great measure to the influence of nitrogen. He concludes by observing, that he does not touch upon the practical application of the subject, wherein the real value of the enquiry consists; but that it is his object to draw attention to an element, which though in some instances so minute in quantity as to be with difficulty detected in our balances, has nevertheless been wisely assigned to discharge the most important functions.

III.

**ANCIENT SEEDS.**—Whilst searching for coal on the estate of Pearceton, near Irvine, a few weeks since, on the workmen emptying the sludge used for cleaning the iron bore, among the sand and gravel a number of grains of corn appeared, which floated on the surface of the water. They were gathered by the men and conveyed to Mr. McCredie, the proprietor. The grains appear to be smaller than the usual size, and in an excellent state of preservation, which is satisfactorily proved by a few of them, which were sown immediately after being found, having now braided, and promising to bring forth abundantly. This wonderfully preserved portion of the staff of life was found at the depth of upwards of ten fathoms; the bore in its progress having encountered clay, sandstone, and different metals; the field was likewise covered with water to the depth of fifty feet. Another singular feature of the case is, that freestone was found immediately beneath the bed of the corn.

**GRAFTING.**—The Royal Academy of Metz once published a report of the progress of gardening, in which they state that a gardener at the Botanic Garden of Metz, named Simon, has grafted a scion of the chesnut on an oak, and that the experiment has perfectly succeeded.

**SWISS HAY.**—The manner of drying hay in the Tyrol—and corn, too, in the rare spots where it is grown—produces an agreeable diversity in the landscape. Instead of being scattered over the meadows as with us, it is suspended upon bars, one over the other at right angles, through a stake of about six feet high, stuck in the ground. These, when covered with the fragrant load, look like green altars erected in honour of Pan, and, together with the fanciful groups employed about them, add greatly to the unwonted and interesting aspect of the scene.—*Mrs. Trollope*.

**THE NIGHTINGALE.**—The male arrives ten days or a fortnight sooner than the other sex, and both immediately repair to the locality which they left the preceding autumn; travelling only by night, as the voice of the male is often heard, at intervals, for a whole day, and only for one day, in places which individuals pass in their progress northward. In autumn they also migrate solitarily, though the contrary has been asserted. It would be at variance with the whole tenor of the Nightingale's habits, and also of the birds to which it is most nearly allied, for it to assemble in small societies at any season. Not even the Robin is more quarrelsomely inclined towards others of its kind, than is this famed "leader of the vernal song." The Hon. and Rev. W. Herbert mentions, that "a Nightingale, which had

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lived two years in a cage full of birds, and even suffered the Wrens to jump and rub themselves on its back, instantly attacked, in the most violent manner, another Nightingale which was placed in the cage." All who are in the least acquainted with the habits of this most noted songster, must have frequently remarked the extreme jealousy of its disposition.—*The Naturalist of July*.—This unaimable trait of singing-birds is not, we fear, confined to the winged vocalist. By the way, the article from which we have made this extract is a most interesting paper, read by Mr. Edward Blyth, before the Ornithological Society, in May, and printed in the last number of *The Naturalist*, a monthly refectory of natural history.

**ACTION OF LIGHT ON RIVER SPONGE.**—In some experiments by Mr. Hogg, recently communicated to the Royal Society, the author found that the green colour of the *spongilla fluviatilis*, or river sponge, is acquired solely through the agency of light, and is lost when the sponge is removed from its influence. As this does not appear to be the case with *Actinææ*, the *Hydra virides*, or any other Polypes, the author is disposed to consider this production as being nearly allied to the Algæ or Fungi than to any tribe belonging to the animal kingdom.

**DIFFERENCE BETWEEN PEARS AND APPLES.**—A long and valuable memoir was once presented by M. Turpin to the French Academy of Sciences, on the difference existing between the cellular tissues of the apple and pear, which observations are extended to knots of wood, to liqueurs, kernels, to the calcareous concretions found in the mantles of the arivus, and to the ossification of animals in general. Those authors, most tenacious concerning the establishment of these two vegetables as different genera, have drawn their characters from the adherence of the lower part of the five styles, to their villosity, to the spheroid form of the fruit, and to the stalk being set in a cavity, characters which are frequently effaced. M. Turpin founds his opinion on the absence or presence of those stony concretions which are to be met with in the cellular tissue of the pear. These concretions he attributes to the aggregation of little globules, which by degrees become clogged with an indigestible matter, which is confusedly deposited in molecules, and from which they receive their opaqueness, hardness, and colour, and to which he gives the name of *sclérogène*. This name he also gives to all matters which are foreign to organization, which are first held in suspension, then deposited, and become hard in the internal cells of the hollow and elementary organs of tissues. Of the cause of this deposit in the pear he is perfectly ignorant at present; but

each concretion, chemically analyzed, consists of bladders of cellular tissue, globules or fecula contained in these bladders, and the *sclérogène* or indigestible matter, confusedly accumulated and mingled with the globules of fecula. The process and manner of formation in these concretions the writer thinks admirably calculated to show the progress of all ossification, whether animal or vegetable.

**AUTUMN GRAFTING.**—July, August, and September grafting will take with complete success. I am myself an operator, and agent over nature to that effect. The young man of reading and observation, who seemed to pause (!) when the question was put to him, but at last ejaculated, "I don't know!—the success must result from the effect of the *descending sap*," uttered this under the influence of the common opinion, that, in the autumnal season the *sap descends*. Under this universal notion, scientific gardeners have hitherto confined their grafting experiments to the season of spring, or what is called "the rising of the sap." The notion of *sap descending* appears to me to be founded on a superficial investigation into the nature of causes and effects. Are there reservoirs in the roots, to contain the descending sap? Or do the roots exude the descending fluid, and so manure the soil in which they are embedded? Cut the roots in winter, and you will find that they contain much less sap than they do in summer. How then, and to what place, has the sap taken its declination? The truth appears that it is not the *sap descending*, but that it is a *gradual decrease of capillary attraction*, or the agency of *optical influence*. Were experimentalists to turn their attention to this subject. I will venture to predict that, in certain localities, grafting may be rendered practicable every month in the year.

**CURRENT TREES FROM CUTTINGS.**—It is known to some practical gardeners that cuttings of the vigorous young shoots of the spring will strike root, if planted at the present period. We tried the experiment in 1836, and having procured some cuttings of a most excellent variety of the white currant, about a foot long, set them in holes, made deep enough to receive three joints, from which the leaves were cut off, but those above the surface were left on the cutting. In propagating by cuttings during the first week of August, we would recommend that each be selected with the wood half ripe, that is, when the cuticle has assumed that bright pale brown, which succeeds to its last faint green hue. If the lower end of the cutting be taken, with a small piece of old wood attached to it, it will be more secure. Ours, however, were not so furnished. The situation should be protected from the glare of the sun, each hole should have a little sharp sand dropped

into it, and after the cutting is placed, and made very firm and secure, an abundant watering should be given. Cuttings so treated, provided that the soil be favourable, and kept moist for a month, succeed so well, that handsome young trees may frequently be obtained by Midsummer, of the following year. We have ocular proof of the fact before us; six or seven of the cuttings of 1836, have two, three, or four young shoots, some with ripe fruit on them, and of size and length sufficient to furnish cuttings for the present season.

**PLAGUES OF GRAPE VINES.**—Insects that prove the most injurious to the vine, are the red spider, coccus or scale, and the mealy or pine bug. The scale, if your vines are in good health, will seldom affect them to any extent. The composition I recommend, after stripping off the loose bark at winter pruning, will be found a perfect preventative for that pest. The pine bug is generally introduced either by the pine plant, or some other exotic stove plant; I have seen it make disagreeable work in the bunches, being obliged to use a feather to remove it. The plants that introduce this pest should be taken out of the house and steeped in the following composition, at a temperature of 150, or even higher if on the pines, and the sooner the insects are destroyed the better, and the pit thoroughly cleansed with quicklime and sulphur, which will be found the most sovereign remedy. The red spider of the three is the most destructive, but by washing the vines with the composition previous to turning them out in autumn, and again before beginning to force, and by keeping the atmosphere of the house in a humid state at the times recommended through this work, when the crop is gathered, this nuisance can be remedied. Then the house can be syringed and kept close for a few days, or a week, which will be generally found to have destroyed those that have been engendered during the time the crop was gathering. The following simple composition is what I make use of for peaches as well as vines, and find it answers well for general purposes: To four pounds of Flowers of Sulphur, add two pounds of Tobacco, four ounces of Nux Vomica, two pounds Soft Soap, dissolved in five gallons of rain water, hot, well-stirred, and used while fresh, laid on lukewarm with a brush, well rubbed into the wood and eyes, at the times before-mentioned.—*Hoare*.

**ROSES.**—If these are to be forced, they should be placed in a house very little higher temperature than a common greenhouse, and as they advance in growth, the temperature may be raised. The very best forcing rose is the crimson perpetual or Rose de Roi, which, whether dwarf or standard, blooms very beautifully. If there is the least sign of the *aphides*, let the plant be well

syringed with water the same temperature as the house, and if this fails to clear them, fumigate the house without delay. Many other roses will force; for when prizes were offered for the best twenty roses of the "China, Noisette, and other hybrids," as the learned people of Chiswick had it in their circular, one person exhibited twenty varieties, in the early part of May, most beautifully bloomed; but the prize was refused because they were in pots; they have since been obliged to give prizes for Roses in pots.

**TURNIP-FLY DESTROYED.**—Sir—I send you the recipe for destroying the turnip-fly:—wood-ashes, sown on the plants early in the morning, when there is a sufficient dew upon them, so that the ashes will stick. It ought to be sown thick enough just to cover the upper surface, and in the manner of soot. A farmer may always collect plenty of wood to make ashes by cutting and keeping his fences in order, and may buy it very reasonably from the cottagers. The person that tries the experiment may rest assured that *not one* leaf will be destroyed, unless there fall a very heavy rain to wash it off the plants.—JOHN PHILLIPS, Hexton House, Herts.

**TO TAKE IMPRESSION FROM LEAVES.**—Take green leaves of trees and flowers, and lay them between the leaves of a book till they are dry. Then mix some lamp-black with drying oil, and make a small dabber of some cotton wrapped up in a piece of small leather. Lay the dried leaf flat upon a table, and dab it *very gently* with the mixture till the veins of the leaf are covered; being careful not to dab it so hard as to force the colour between the veins. Moisten a piece of paper, or what is better, lay a piece of paper between some sheets of moistened paper for several hours, and lay this over the leaf that has been blackened with the liquid, press it gently down, and then lay a heavy weight upon it and press it down very hard. By this means you obtain a very beautiful impression of a leaf with all its veins; even the minutest will be represented in a more perfect manner than they could be drawn with the greatest care. Impressions thus taken may also be coloured in the same manner as prints.

**PLANTING AND REMOVING TREES.**—There is a good deal too much stress laid upon the instructions to take up large balls of earth with shrubs. From two nurseries we have seen the most extraordinary difference in the taking up of trees—the one sent every fibre of the root, but no earth; the other sent balls of considerable size, but all the points of the roots chopped off completely. Now we venture to predict, that where all the fibres have been saved undamaged, the plants will thrive in-

mediately, though there were no balls; and that those with the balls will be greatly worse if the roots are shortened.—GLENNY.

**FRUIT OF THE PORTUGAL LAUREL.**—We would strongly recommend its being cultivated in woods and plantations, not only for its beauty, but for its fruit, which is, as well as the common laurel, the favourite food of the pheasant. Pheasants are natives of, and originally came from the same spot whence the common laurel was first brought, that is, from banks of the ancient river Phasis, which flows into the Black Sea, from which they receive their name.

**TEST OF GOOD FLOUR.**—Mr. John Babcock, of London, gives the following rule to ascertain the quality of flour:—"Flour which is pure and unadulterated may be known by your seizing a handful briskly, and squeezing it half a minute: it preserves the form of the hand in one piece, although placed rudely on the table. Not so with that which contains foreign substances: its adhesive property is weak, and falls to pieces immediately. The whiteness of flour is no evidence of its goodness; the different materials used in adulterating flour have a tendency to whiten it."

**HUMBUG AND SCIENCE.**—How far the anatomy of an entozoon found in the belly of a gnat; the generic distinctions of the stylops found upon a bee; a lengthened dissertation on the nerves of a mouse's foot, or the toe of a trogon can advantage society or benefit science, we too are at a loss to determine. And yet, the transactions of our societies are filled with these, at best, useless absurdities; the results of which, and the means by which they are derived, are not only a matter of surprise to the uninitiated, but even of controversy to the learned.

**USE OF THE WALNUT TREE.**—Walnuts yield half their own weight in oil, whose flavour is considered equal to that of the finest Lucca oil. This very fruitful tree, which we see flourishing along the high road, and in the orchards of the peasants, is one of great utility to the German; his furniture is made from it, the leaves dye a good black, and he feeds his cattle with the shells of the nuts that have supplied his oil.—*Germany and the Germans.*

**LARCH FIR.**—Several larch trees on the lands of Cartruse, the property of Sir R. Bateson, Bart., mayor of Derry, when felled, measured forty-one feet in length. This is an instance of very large and rapid growth, as the trees were of but twenty-two years standing.

**MODE OF PRESERVING LATE DESSERT APPLES.**—The first thing to be attended to is the gathering, which should always be done when the apples are dry and ripe; they are always

best gathered in small baskets to prevent their being bruised, and care should be taken to rub them as little as possible. They should then be carried to the store-room, and laid on the floor from six to twelve inches in thickness, according to the size. The large kinds may be put thicker than the small ones, as they will not lie so close; in this state they may be left for a month, when they should be carefully looked over, but not wiped, and any that are damaged thrown out. Those that are sound should be put into shallow boxes or trays, which are best made of willow or poplar boards, being very light and tough. The boards should not be planed, as they will be warmer and softer without: no straw is used. My trays are made of the following dimensions—the sides and ends of three-quarter-inch stuff, and the bottom two inch: the side boards are four feet long, but the end boards are only three feet two inches apart, leaving five inches of the side board at each end for handles. The end boards are one foot ten inches and a half long, the bottom boards two feet, nailed unto the sides. The depth of the trays must not be more than three inches for small apples, and five for large ones; they should all be made the same width and length. They may then be placed one on the other. As long as they can be conveniently lifted up, it will be better to give a little air when first put up, by inserting small pieces of wood between the trays. In frosty weather, or when there is any appearance of the apples shrivelling, shut down close. The uppermost tray should have a lid. These trays will be found to hold a large quantity of apples in little room, and will be useful for many other purposes, such as drying seeds, &c. During the late winter my nonpareils and ribstone pippins, kept in trays without any other covering, were scarcely injured. In the same room the same sorts, in baskets lined and covered with straw, were nearly all frozen. I have tried the above plan some years, and have always found apples keep better so than in any other way.

**ASPHODEL.**—The Asphodel is said to be useful in driving away rats and mice, which have so great an antipathy to this plant, that if their holes be stopped up with it, they will rather die than pass.

**SIMPLE REMEDY TO PURIFY WATER.**—It is not so generally known as it ought to be, that pounded alum possesses the property of purifying water! A large table-spoonful of pulverized alum, sprinkled into a hogshead of water (the water stirred round at the time), will, after the lapse of a few hours, by precipitating to the bottom impure particles, so purify it, that it will be found to possess nearly all the freshness and clearness of the finest

spring water. A pailful containing four gallons, may be purified by a single tea-spoonful.

**EFFECTS OF CULTIVATION ON PLANTS.**—Cultivation brings forth singular intermediate productions; and by its magic power, we have seen the coriaceous and bitter almond transformed into the luscious peach; the sloe converted into the delicious plum, and the common crab transformed into the golden pippin. The same facts are observed in vegetables; the celery sprung from the nauseous and bitter *assium graveolens*, and the colewort is metamorphosed into the cabbage and cauliflower.

**INTRODUCTION OF APRICOTS INTO ENGLAND.**—The apricot tree was first introduced into England from Italy, in the year 1524. by Woolf, gardener to Henry the Eighth, who it appears introduced several valuable fruits about the same period.—*Gough's British Topography*.

**PARSNIP WINE.**—Wine made of parsnip-roots approaches nearer to the Malmsey of Madeira and the Canaries than any other wine. To every 4lbs. of parsnips, clean and quartered, put one gallon of water; boil them till they are quite tender; drain them through a sieve, but do not bruise them, as no remedy would clear them afterwards. Pour the liquor into a tub, and to each gallon add 3lbs. of loaf sugar, and half an ounce of crude tartar. When cooled to the temperature of seventy-five degrees, put in a little new yeast; let it stand four days in a warm room, then turn it. The mixture should, if possible, be fermented in a temperature of sixty degrees. September and March are the best seasons for making the wine. When the fermentation has subsided, bung down the cask, and let the wine stand at least twelve months before bottling.

**TO DESTROY THE LARVÆ OF THE COCK-CHAFER.**—On the occasion of a secret composition being announced lately for the destruction of the white worm (the larvæ of the cockchafer), M. Letellier de Saint-Leu-Taverny has made known to the Academy of Sciences that, since 1835, he has communicated to the Society of Natural History experiments, proving that the greater number of poisons, which are the most active on man, have scarcely any effect on these larvæ, and that alkalies (cyanuses) are the most speedy, as well as the most certain, and the least expensive means of destroying them, without injuring vegetation. In consequence of this discovery, he has made use of the residuum of the calcination of animal matter with alkali (potash or lime), which is impure (cyanuse.) He says the success is satisfactory, and he has restored sickly shrubs to full vegetation which were supposed to be devoured by these insects. He owns however, that he could not

repeat his experiments in 1836. (*L'Hermes*, Feb. 1837.)

**DRYING, PRESERVING, AND ARRANGING SPECIMENS.**—First, be careful to gather the specimens when dry; they may be brought home in the hand as a nosegay, or, what is much better, put into the crown of the hat, or in a tin sandwich box. Then taking up each specimen singly, lay it smoothly between the leaves of a large book, or several sheets of common paper—then another specimen a few leaves distant, and so on till the box is full—this done, tie it up tightly with a string, and put a weight upon it (such as a flat iron or two). Thus the plants are to remain for a day, and then changed into a fresh book, to dry them still more, and so on for four or five days, when they will all be found dry, of good colour, and fit to put away. Some few plants require a different treatment. In thick stalked and woody plants the under side of the stem is first to be cut away. Berries must be dried by being hung up in the sun or air. The stone-crop and house-leek, as well as the heaths, must be dipped three or four minutes in boiling water, before laying out—if this be not done the juicy plants will grow even for a long time after they are placed in the papers, and the leaves of the heaths will soon fall off; also, water plants are better for being laid between folds of calico for the first day. In drying plants blotting paper has been considered the best, but Mr. Bentals paper recently advertised, manufactured for this purpose, is found to be admirably suited for the purpose. Dried plants are very subject to be devoured by insects, if kept in a damp place. The best way to manage herbariums thus infested is to spread out the various plants to the sun and air for a day or two, though if well dried, and kept so afterward, the plants will not be injured. Each plant should be fastened to a separate piece of paper, in the following manner:—Wash over a sheet of paper with thick gum water, the thicker the better, and let it dry perfectly, then cut this into various-sized strips, which will form bands to fasten on the plants with. Thus furnished with materials, place the dried specimen upon the paper intended for it, take up a proper-sized strip of gummed paper, and having wetted the gummed side of it with the end of the tongue, place it across some part of the specimen, then another in another place, and so on till the whole is properly fixed. Some persons glue their specimens down, others sew them on, but the above method is far superior to either, and much less troublesome.

**HAARLEM TULIP GARDENS.**—Adjacent to the grounds of the Pavilion, in a southerly direction from the town, are the famous tulip

and flower gardens, or "Bloemen-Tuin," as they are called on the various sign-boards over the entrances. Each garden is secluded from the public road by a high wall or a brick house tidily painted; and when admitted, you find yourself in the midst of offices or warehouses devoted to the great business of drying and packing the roots. Thence the garden stretches out to the length of a quarter of a mile, by a breadth of a hundred yards, and is separated from other gardens, as well as frequently divided across by partitions of wood six feet high. In the sunny square spots thus sectioned off, we perceive, according to the season, all the varieties of tulips, dahlias, hyacinths, ranunculuses, and various other flowers, also shrubs and plants. All the flowers appear to grow from a soil like that of the sea-shore; but this is merely an exterior dressing; beneath the layer of sand the ground is rich and soft like that of the best prepared flower-beds. The drying-houses are filled with shelves, in stands, on which are spread myriads of roots, and in adjacent apartments, men are kept constantly busy packing for exportation.

**DESTROYING THE CATERPILLAR ON GOOSE-BERRIES.**—I always use lime water, and never powder of lime. I take a garden syringe, and, screwing on the bent disperser, I apply the water, first under the bushes, which brings down a great portion of the caterpillars, and sends another portion to the upper surfaces of the leaves. To destroy these last I do not use the syringe, but the common watering-pot, with the rose on. I attack them as soon as they are hatched, when they are little bigger than small points of white threads on the under sides of the leaves. I would strongly recommend the syringe to all gardeners, as the best instrument for applying lime-water, or, indeed, water of any kind, to the under sides of the leaves of bushes.—T. S.

**LEECHES.**—Leeches kept in a glass bottle may serve as a barometer, as they invariably ascend or descend in the water as the weather changes from dry to wet, and they generally come to the surface prior to a thunder-storm.

**TO PRESERVE APPLES FOR WINTER USE.**—The apples intended to be preserved for the winter should be allowed to remain on the trees till quite ripe, when they should be gathered in dry weather, and placed in a heap for five or six weeks, in order to heat; they should be carefully wiped dry, and those that are perfectly sound, packed in large jars or boxes, so as to be excluded from the air, which will keep them sound and plump, and retain their flavour. — *Phillips's Pomarium Britannicum.*

#### THE VERBENA.

The Verbena is one of the most showy and

best adapted for bedding out, as well as for the decoration of the rocky and greenhouse. In fact more so than a great many other plants we have in our gardens. The humble habit and truly dazzling character of the flowers of some of this tribe, sheds a ray of liveliness and pleasure wherever they are to be seen or met with, whether in the bed, clump, rocky, or greenhouse.

The Verbena or vervain, belongs to class 14, Didynamia; order 2, Angiospermia; and in nat. ord. Verbenacæ, and was introduced into Britain from Spain in 1640: this species however was an annual. Most of the family are denizens of America; but all the species of this genera introduced, created very little interest until 1837, when that lovely gem, *V. milindris*, was brought into notice: since then, considerable zeal has been manifested towards the Verbena; consequently, we have now not only species, but many varieties of exquisite beauty, thus evidencing the industry and perseverance of the florist, whose grasp now, I may say, have made this one, like many others, his own. But notwithstanding this diversity of species and varieties, they are still deficient as to the perfection of the flower, and that prostrate or necessary habit seen in the *V. milindris*, according to Mr. Clenny, the first authority in these matters at the present day; his opinion can be seen by reference to the properties of flowers in *The Gardener and Practical Florist*.

**Mode of Propagation.**—The Verbena may be increased by seeds, cuttings, and layers, with the greatest facility. **By Seed.**—This is only practised when in the pursuit of new varieties, or any variety or species newly introduced by seed. The seed should be collected in autumn when ready, cleaned, dried, and laid by carefully in paper bags until February, when it may be sown in 60's filled with soil composed of leaf-mould, sand, and sandy peat finely sifted, watered, and plunged into the hotbed; the seedlings to be afterwards treated exactly as described for other seedlings, using the same soil as above. **By Cuttings.**—There is hardly any plant that strikes readier than the Verbena by cuttings, and this is decidedly the best system of propagating this family. The cuttings may be taken off about the end of August or beginning of September, choosing those lateral shoots not yet in flower, made, and put in the same as other cuttings, using 60's filled with leaf-mould, sand, loam, and a very small quantity of sandy peat well incorporated, and beat into the pots firmly; and the cuttings may be put in as thick as the size of the pot will admit; after watering, let them be plunged into the bed, when they will strike freely, and in a very short time; should



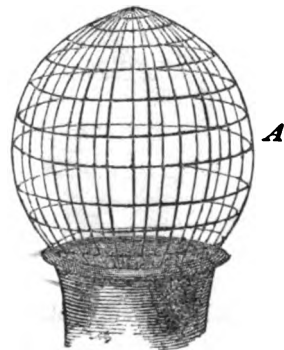
you observe any of the cuttings, when beginning to strike, showing flower, pinch the tops off, and at the same time pay attention, should the sun be powerful, to shading. Being well struck, harden them off, and when the weather begins to get cold, about the beginning of October, you may commence to house them away into the pit. A cold pit will do well enough, provided it be a good depth, that is, that the plants will be a good distance from the glass; however, a pit, when there is a little fire occasionally, or otherwise when the temperature is kept near or about 40 deg., I find by far the best, after trying and seen tried many other plans. *By Layers.*—The Verbena being naturally a creeping plant, and striking roots into the ground at every joint, each of these rooted joints or layers makes a plant, consequently this method of propagation is a simple process, and plenty of young plants for a future supply can be thus obtained. About the beginning of October, or even later, according to season and locality, look through your Verbena beds, carrying along with you a wooden tree, or small riddle, to put the plants you lift on, a trowel and knife, to lift and separate them from the parent plant, and a pot with painted tallies, to name each variety, as lifted, in order to preserve regularity, then separate as many plants as required, cutting the stem behind the last struck joint, keeping well clear of the roots, then put the trowel down below the roots; should any ball remain attached so much the better; after pot them in small 60's, in soil composed of leaf mould, sand, and a little loam; after being well watered, place them into the hotbed, for a few days, until the roots begin to strike through the soil, then remove them gradually into the pit with those propagated by cuttings; this method does well enough; I would, however, prefer by cuttings, as they generally make the best plants, and I have always observed, keeps better during winter, when in a cold pit or frame.

*Winter Treatment.*—During winter and spring there is some little attention requisite, as to watering, keeping the plants clear of insects, leaves, and any green matter (caused by damp), accumulating on the surface of the pots, this should be well attended to, as at times it does great injury. The Verbena, like most other plants, cannot bear to be too damp at this period; therefore considerable attention is necessary in watering; too much or too little should not be given, there is a medium: keep the soil moist, and that is all required. When they begin to start into growth, should any insects make their appearance upon the plants, they should immediately be smoked with tobacco, which soon puts an end to their existence. As I have

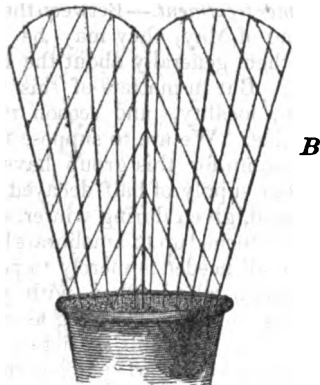
mentioned elsewhere, that it is of importance to have the plants considerably distant from the glass, and by this it might be thought the plants would get drawn and weakly, especially in spring, to prevent this taking place, and as, perhaps, a few more cuttings may be desirable to put in, to increase the stock for leading out, cut the tops off, which will do for cuttings, and cause the plants to throw out lateral or side shoots, and at the same time, every fine day give plenty of air. This is all that is necessary at this season, until removing the plant into a cold frame about the beginning of May, thence out entirely, to harden them off before planting and bedding out.

*Summer treatment.*—Between the middle and latter end of May, they may be bedded out. I plant them generally about the 12th or 15th of May. But in matters of this nature, the situation, locality, and season must be the main guide. We are to suppose first that the bed or clump for this group have been well dug, a fair supply of half decayed leaves and peat mixed, given during winter, and allowed to remain turned up to ameliorate by the frost; and now all needed is merely to point, in and give a rough rake. Then with your trowel make pits, and plant (keeping as much ball as possible) the different varieties alternately, two feet and half apart, placing the tallies to each plant, give a good watering, and after rake neatly off the bed. When the plant has commenced to grow vigorously and made a few shoots, get some firm pegs for this purpose, but if not at hand wooden ones will do), and lay the shoots down, stretching in that direction that fills the bed quicker, until the bed is completely covered; keep it neatly raked and pegged down before being covered.

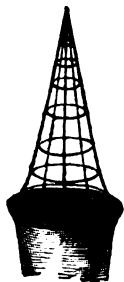
*General remarks.*—As it is sometimes, I may say at all times, desirable to have a few plants of the Verbena among others, to decorate the greenhouse, after other plants have been removed into the summer quarter, I would here add a few useful hints on this point. In spring



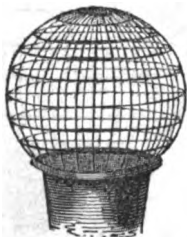
fix on as many plants as you need, of the cuttings put in last autumn, and which have been kept over winter in the pit. In April they will be growing vigorously, shift them from 60's to 48's, and when again requisite into 32's, using leaf-mould, sand, and old peat for your compost. When long enough to commence to train, fix your trellises into the pot; they may be of wood or wire, the latter decidedly the best, being more neat, and not near so clumsy as wooden ones, besides more durable, and they will do for any plant of the same description as well as the *Verbena*. They should be kept regularly painted, which



will prevent anything like rust, and will do thus no harm to the plants. In this case I consider no colour is preferable to that near-



est the foliage—green, which prevents the trellis as much as possible from being seen at



any time before being completely covered. I do not here allude to stakes and trellises gene-

rally, there are exceptions which should be painted otherwise, which I will notice when treating on them. A trellis as at *A*, covered with *V. milindris latifolia*, for instance, has a beautiful effect. It appears a truly scarlet globe, and when the sun shines upon it, the eye is quite unable to stand its brilliancy.



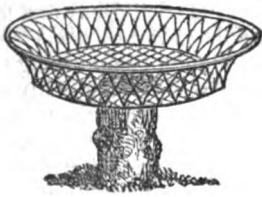
*B C F* has three feet of stronger wire which goes into the soil in the pot. It can be distinguished at *f*. *B* and *C* are flat only two sides; *f*, an umbel reversed; *C* and *D* has



four sides, consequently four feet; *A*, the same, like a globe. The *Verbena* appears to good advantage in neat stone vases, *G*; this however



is best situated about the parterre, nevertheless it suits in many other situations; *H* shows one of them, a basket on wooden pedestal; *I*, the same without a pedestal to be fixed into



H

the ground, by means of wire feet, ffff. I saw very excellent ones for this purpose



last season at Crossbasket House, Lanarkshire, the seat of—Downie, Esq., and which the gardener informed me had been sent up from London, these were painted green, which I think does not suit in this case. Nothing can surpass stone or ash colour. In the former case I would not have the trellis seen, but in the latter it adds to the beauty to be seen; and I think the colour above contrasts better than any other with the green around it. The trellises being fixed, commence to train the plants on regularly as required, using very small strings of bass mat neatly twisted like twine to be seen as little as possible, in a short period the whole will be entirely covered and in a complete blaze.

The original species of *Verbena*, I may say, are rock plants, and a beautiful display they make; the crevices may be filled with suitable soils, and planted. When bedding others, I would recommend *V. melindris latifolia* for the purpose. I may further add, that *V. melindris* stood out with us here, last season, until the beginning of January, but under a south wall. In the *Verbena*, besides its dazzling, flowery, and humble habit, there is something very pleasing, and more particularly at this period, when the beauties of Flora are beginning to feel the rude blasts of Boreas. To meet with this humble beauty on the rocky, or the parterre, or in a clump, along the side of the walks or drives leading through the plantations, it causes a kind of pleasing melancholy, on glancing around us, and perceiving the leaves lying withered in heaps, with the yellow, dark, and red tints of foliage exhibiting in every part of the woods. It reminds us of the words of the Poet of Seasons, and so beautifully described by him in his Autumn—

“But see the fading many coloured woods,  
Shade deepening over shade the country round,  
Imbrown a crowded umbrage dusk and dum,  
Of every hue; from wan declining green  
To sooty dark.” J. LOTHIAN.

#### NATURAL MODE OF TRAINING CLIMBERS.

MR. PAXTON'S notions of the proper treatment of climbing plants coincide a good deal with our own, as may be seen on reference to what we have already advanced. Although climbing plants are among the freest and most gracefully growing objects in the vegetable kingdom, cultivators generally have a practice of *materially curtailing their beauty by training their branches in straight lines, and tying them closely to that which supports them*. A climber, when it is decked in its native grace, should have all its minor branches free and flowing; and if the train stems are not hidden by side shoots, they too should take that irregular, crooked direction which they would be inclined to do in a state of nature. All endeavours, therefore, to train them in anything like order, or place their branches by rule in parallel lines, unless with the view of giving them effectual support till they have acquired strength enough to develop a due proportion of lateral branches, are much to be deprecated as destructive of the true and natural expression of the plants. After observing that climbers ought to be treated naturally, Mr. Paxton says, if we examine a climbing plant in a wild condition, we shall soon have a sufficient illustration of this point. Springing up at the base of a mass of bushes which vary considerably in height, or near a tree or a group of trees, they fling their flexible shoots over the former in all directions, until they themselves appear to constitute the bush, while its own branches are only here and there visible at the extremities. On, entwining the stem of a tree, they continue mounting till they reach its branches, and then throw themselves along these, suspending carelessly from their points. In these examples we have the type of what we call the natural treatment of climbers. To apply it first to those beautiful dwarf summer plants, of nearly herbaceous habits, such as *Tropæolums*, *Maurandays*, *Thunbergias*, *Lophospermums*, &c., we may observe that the custom of training these over trellises of various forms is *by no means suited to their character*; nor does it at all contribute to heighten their effect. Their own natural elegance is *lost in such circumstances*, and they are rendered far too formal to be pleasing. We agree that the better way of managing these plants is to put one or several bushy stakes into the pots or the ground where they are growing, and let the plants scramble over these in their own fashion, simply assisting them when they seem likely to fail in clinging properly to their support, or when the young stems are disposed to wander away in another direction. This may easily be done

by the use of a small piece of matting occasionally, or by placing the shoots so completely amongst the branches of the stake which is to sustain them, that it will be almost impossible for them to extricate themselves. We cannot agree with Mr. Paxton in recommending a climber to be planted at the foot of a living tree. He says, but the more satisfactory mode of accomplishing the purpose with plants of so large a character as the species of *Clematis* or Honeysuckle, would be to plant a moderate-sized lilac—or other shrub which would be ornamental in itself—in the required position on a lawn, and *put in the climbers around it*. These last would, in process of time, *completely envelope the shrub that sustained them*, and yet that shrub *being alive*, would constitute a more permanent support than any dead and severed branches could possibly do, while its foliage and blossoms would always supply any defect or vacancy that might occur from the climber not completely covering it. This is theory run mad. The lilac has wide spreading matted roots, close to the surface, robbing the ground to a great extent, and no creeper could exist in health when it was so deprived of nourishment. Mr. P. continues. The practice of which we have been speaking is by no means to be considered applicable only to climbers in the open ground, or even to include alone, in addition to these, such dwarfer sorts as will readily compress themselves into a small compass. We have already mentioned the charming *Thunbergias* among low-growing kinds, because the plan is so peculiarly appropriate for them. But many *Kennedys* and other plants of the like character might be treated according to the same principles, and would yield an amount of novelty and beauty which would quite astonish some cultivators. In the beds and borders of pretty extensive conservatories, too, the taller and more vigorous-growing kinds might find a suitable place. A mass of *Clematis Sieboldii* or *cærulea*, for example, or some of the well-known species of Passion-flower, or several of the *Ipomœa* tribe, would look extremely well when suffered to overrun a common shrub; and, entangling their branches in every possible way, create a large bush, profusely enlivened with both verdure and blossom. The other class of climbers to which we alluded in the commencement comprises the tall-growing species just mentioned; but, instead of their inwreathing their branches into a bush, they ascend some stem or pole, and fling out their drooping and flower-laden shoots from near its summit. Of this tribe, the wild Honeysuckle and *Clematis* constitute familiar illustrations. To train these in a manner resembling the natural one, they require a tall poll, but to render

this still more like nature, it should have a quantity of branches on the top; and as these branches would soon decay and fall on a dead pole, *it is desirable to have living trees*, of a common description, for supporting tall climbers. A young elm would be especially suitable; and if it were transplanted at the time of putting in the climbers, so as just to retain its vitality, but to check its extreme vigour, those climbers would speedily outgrow it, and prevent it from spreading too widely. In some parts of most pleasure gardens, there are generally one or more trees—sometimes very old and decayed, but occasionally quite young—overgrown with ivy, and becoming yearly all the more beautiful from being thus enveloped, even though the ivy be constantly strangling and destroying the natural growth of the tree. By planting the wild *Clematis* or Honeysuckle at the bottom of such trees, and encouraging it to ascend them, and mingle itself with the ivy, the piqueness of the object would be very materially increased, and the best of all positions furnished for the climbers. Such is the strength of the vegetative power in ivy, however, that unless the other climbers be planted by its side while it is quite young, *there is a great chance that it will smother them as well as the tree*. To avoid this, therefore, the *Clematis* should be inserted near it as soon as it is at all perceived to be attaching itself to any tree with a likelihood of ultimately outgrowing it. Such advice, amounts, in our opinion, to nonsense. Ivy has killed hundreds of trees, and damages every one it clings to in any quantity. We are surprised at the recommendation, though we like the opening parts of the paper.

#### EGGS AND POULTRY.

AMONG all nations, and throughout all grades of society, eggs have been a favourite food. But, in all our cities, and particularly in winter, they are sold at such prices that few families can afford to use them at all, and even those who are in easy circumstances consider them too expensive for common use. There is no need of this. Every family, or nearly every family, can, with very little trouble, have eggs in plenty during the whole year; and, of all the animals domesticated for the use of man, the common dunghill fowl is capable of yielding the greatest possible profit to the owner. In the month of November I put apart eleven hens and a cock, gave them a small chamber in a wood house, defended from storms, with an opening to the south. Their food, water, and lime were placed on shelves convenient for them, with nests and chalk nest-eggs in plenty. These hens continued to lay eggs

throughout the winter. From these eleven hens I received an average of six eggs daily, during winter, and whenever any one of them were disposed to sit, namely, as soon as she began to cluck, she was separated from the others by a grated partition, and her apartment darkened. These cluckers were well attended, and well fed: they could see and partly associate through the grates with the other fowls, and, as soon as any one of these prisoners begun to sing, she was liberated, and would very soon lay eggs. It is a pleasant thing to feed and tend to a bevy of laying hens: they may be tamed so as to follow the children, and will lay in a box. Egg-shells contain lime, and when, in winter, the earth is bound with frost, or covered with snow, if lime is not provided for them, they will not lay, or, if they do, the eggs of necessity must be without shells. Old rubbish lime, from chimneys and other buildings, is proper for them, and only needs to be broken. They will often attempt to swallow pieces of lime and plaster as large as walnuts. The singing hen will certainly lay eggs, if she finds all things agreeable to her; but the hen is so much a prude, as watchful as a weasel, and as fastidious as a hypocrite: she must, she will have secrecy and mystery about her nest: all eyes but her own must be averted: follow or watch her, and she will forsake her nest, and stop laying. She is best pleased with a box covered at the top, with a backside aperture for light, and a side door by which she can escape unseen. A farmer may keep one hundred fowls in the barn, may suffer them to trample upon and destroy his mows of corn, and other grains, and still have fewer eggs than the cottager who keeps a single dozen, who provides secret nests, chalk eggs, pounded bricks, plenty of corn, water, and gravel for them, who takes care that his hens are not disturbed about their nests. Three chalk eggs in a nest are better than one, and large eggs please them most: I have often smiled to see them fondle round and lay in a nest of geese eggs. Pullets will begin to lay early in life, when nests and eggs are plenty, and when others are chuckling around them. A dozen dunghill fowls, shut up away from other means of obtaining food, will require something more than a quart of corn a-day. I think fifteen bushels a-year a fair allowance for them, but, more or less, let them always have enough by them, and after they have become habituated to find enough at all times, a plenty in their little manger, they take but few kernals at a time, except just before retiring to roost, when they will take nearly a spoonful in their crops; but, just so sure as their provisions come to them scantied, or irregularly, so surely will they raven up a whole crop full at a time, and will stop laying. A

dozen fowls, well attended, will furnish a family with more than two thousand eggs a-year, and one hundred full grown chickens for the fall and winter stores. The expense of feeding a dozen fowls will not amount to more than eighteen bushels of corn. They may be kept in cities as well as in the country; will do as well shut up the year round as to run at large; and a grated room, well lighted, ten feet by five, partitioned from a stable or other outhouse, is sufficient for a dozen fowls, with their roosting places, nests, and feeding-troughs. In the spring of the year five or six hens will hatch at a time, and the fifty or sixty chickens may be given to one hen. Two hens will take care of one hundred chickens well enough until they begin to climb their little stick roots: they then should be separated from the hens entirely. I have often kept the chickens, when young, in my garden: they keep the May bugs and other insects from the vines, &c. &c. In case of confining fowls in summer it should be remembered, that a ground-floor should be chosen, or it would be just as well to set in their pen boxes of well-dried pulverised earth for them to wallow in in warm weather. Their pens should be kept clean.

#### GLENNY'S GARDEN PRACTICE.

THE taking up of dahlias, and properly housing them for the winter, occupies the greater part of an amateur grower's attention during the month of October, or, if the season be protracted, of November. And there are many ways of keeping them, but the principal object is to keep them free from frost, and wet, and heat. The frost will kill them at once, wet will cause them to rot in parts, and often at the crown, where all the buds are for the next year's growth; and heat will dry and shrivel them, and kill the buds as completely as wet or frost. Many keep them in boxes of sand, or earth; some keep them as they would potatoes, covering them merely with straw or potato haulm, or other litter. I have always varied my winter's protection according to circumstances, for instance, some roots come up very weakly and fibrous, instead of tuberous: these I at once potted before they dried up, closing the earth about them as carefully as if I were planting them in spring, but without watering them, and in the potting avoiding the breaking any of the roots; these I placed in the greenhouse, away from any drip, and never let their earth get thoroughly dry, for that is certain death in such a case. Here they remained until they began to grow, or showed that they never meant to grow; for with all the care that can be taken, they will go sometimes; and if they be not potted, as mentioned, not one in ten would survive. In other

cases there will be heavy tubers, with very weakly necks, and when these small necks break, the tuber so broken, as it were, though not detached altogether, is as well off as on; these should be carefully handled, and it will be as well to remove any that break at once, and that may be the means of saving the remainder. The ordinary run of tubers, such as the majority always prove, may be thus disposed of; any that are very choice may be taken in doors, to be kept in the best way according to circumstances, and the bulk may be thus treated: cut the stems close at one inch or half an inch long, dig in a sheltered place, where it is well drained, a space large enough for the quantity, six inches deep, as if you were going to store potatoes, put a little straw or litter at the bottom, and then place the tubers (previously well dried), crown downwards, as close side by side as you can, throw a layer of very dry mould all over them, and put another layer of tubers, crowns downwards, falling rather short of the others, and then a layer of dry earth. The next layer must come still short of the last, until they form a bank, almost like a bank of potatoes; put a good six inches of straw all over them, and on that a good six inches of soil. These will be preserved as well as in any other situation, and far better than many which are housed. The pit is not disturbed till the spring, when they will be found generally in excellent order. The more choice ones were generally packed in a dry apartment, with dry sand or sawdust, and crowns downwards, the object of this being to prevent the moisture which often lays in the bottom of the stalk from rotting out the crown of the tuber, which is the only place whence new shoots are obtained. The preparation of the tubers for storing consists of drying them in the shade before they are put away, and cutting back the stem to as short a length as will just preserve all the eyes and crowns. The labels of dahlias must be fastened with wire, and be themselves of a lasting nature, otherwise the winter will rot the whole concern, and the labels will be useless. The loss of the names of plants or roots, where there is nothing to indicate them, is all but a loss of the plants themselves, for there is no dependence on what they are, and therefore they cannot be used until grown again and the name ascertained. Pot-roots, which have never been planted out at all, may be allowed to grow in the house with very little water, and at last when they die down, the pots may be packed on their sides, the plants being cut off within an inch or two of the surface; here they may remain till they are wanted for propagation. But scores of growers merely take up their dahlia tubers, and pile them in a heap

in any corner, covering, if the frost could reach them, but taking no care whatever if it could not. Many hang them up in a dry place, free from frost, and so lose any that are weakly and shriveled; but the principal losses occur from taking up too early, or leaving the roots exposed too near the surface in the open ground. If dahlias were earthed up, so that frost could not reach them, they would, like other herbaceous plants, spring up again in the next season, and be much safer than by any other mode of protection; and one year in a waste piece of ground some hundred seedlings being too late to bloom were earthed up in the rows the same as potatoes would be, and not a single tuber missed growing the next season, this was pretty good proof that it would be no bad mode of preserving roots generally. The reason why I prefer removing them altogether is, that I think it desirable to check growth and give a rest, as I have known them when undisturbed to commence growing again in a mild autumn, and exhaust themselves before they were taken up; but earthing up does a good deal towards preventing this, as it throws off the wet. There is never any danger of losing those plump little tubers which have strong necks and are short and close to the crown, which is always the case with healthy well matured pot-roots, they will stand almost anything but frost and fire. Those who grow the dahlia largely, should look out for dry roots of the kind they want, before people actually store them away, and when they can depend on parties, they should try to exchange roots of the sorts they have grown a long time. Dahlias get tired of the same piece of ground as well as everything else, it merely takes longer to hurt them because they are planted so far apart, that if the soil be tumbled about at all there must be some change. Yet, I have seen a piece of dahlias which for three years runing had every plant on the same spot. I always used the common precaution of planting them in different places, generally about half way between the spots in which they grew the year before. This is easily managed by keeping the distances from one another the same, but the distance of the first plant different; thus, if you planted the first row three feet from the edge of the ground last spring, place the first row on the edge or six feet from it next spring, and if the first plant in the row was three feet from the end last time, let it be six feet from the end next time. But notwithstanding all this, there is a good deal in locality, and at this time an exchange of roots with some one you can depend on is advisable, and well worth the attention of the amateur.



THE BIRCH.—BY JAMES GRIGOR.

**THERE** are two leading varieties of the Birch; the common upright-growing tree, which has thick downy leaves and smooth bark, and the weeping variety, which has thin shining leaves and dark brown bark, dotted over with exudations, which, when rubbed, has the appearance of common resin. The former is a tame-growing tree, with little that is striking in its outline; the other is certainly one of the most graceful objects in the British Sylva. In the North, and especially beside rivers, rocks, and ravines, it accompanies nature in all her striking features; and it may be often seen in great beauty, rising in open situations where no other tree would thrive.

Landscape gardeners, or such as pretend to the art of laying out grounds, have, in many instances, done miserable things with this tree. Instead of casting it in masses around the more striking and abrupt parts of the distant landscape, where such have existed, it is often to be witnessed in profusion, close to a mansion, as if the wildness of nature had yet to be overcome in such places; or, which is the same thing, as if the house had been erected in a wilderness, where the dominion of nature had not yet given way to that of art. In the course of a short time, we shall in all probability, have sound views promulgated regarding the important, though simple art of adorning landscapes with trees; freeing it from the mysterious nonsense in which it is sought to be enveloped in some quarters, and when this takes place, we may expect to find the Birch, as well as all other trees harmonizing with, and consequently, aiding nature in all her aspects.

I take the liberty, therefore, of laying it down as a rule, that although a few may be intermixed with others near to a mansion, even for

the sake of the sweet odour they emit after rain, their proper province is on the high and sequestered paths of nature, where they should be made to prevail in considerable masses, and where the trees selected should be invariably of the weeping variety. The finest specimens of this species in Britain, are on the banks of the Findhorn, a noble and rapid river near to Forres, in the North of Scotland, where it has affixed itself throughout the district, in some parts overhanging a cliff, in others, planting itself on the face of the steep rock over which it suspends its masses of spray ten or twelve feet in length, beautifully diversifying the picturesque scenery in that part of the country. Viewed in such situations, this tree becomes one of the chief ornaments of nature; for when it attains to maturity, its chapped and silvery bark harmonizes better than any other tree with wild and craggy surfaces; and in the extreme mountainous parts of the country, it is the only tree which can be advantageously introduced, either as an ornament, or for the purposes of its timber.

The Birch ripens its seeds in September and October, where they should be gathered and spread thinly upon a floor in any airy situation. In the beginning of the ensuing April, select if possible, a damp though sandy plot of ground, which having been dug and carefully raked, may be laid out in beds 4 feet in width, with a foot-path between of 15 inches wide. At a time when the wind is still, let the surface of the beds be almost entirely covered with the seeds, for many of them will not germinate, and if they did, it is preferable to have them thick so as to protect each other when they begin to grow. I am no advocate for thick sowing in general; but in this in-

stance I have always found it to be necessary. The sowing completed, the next thing to be done is to set the line by the edge of the first bed, and with the spade to throw up from the foot-path a light sprinkling of soil, carefully distributing it over the surface. This sprinkling must be so light as scarcely to hide the seeds, for if they are thoroughly covered in such soil they will not grow.

The operation will of course be continued over all the plot, when the whole may be gently rolled with a garden roller. Should the soil be of a loose and dry nature, it is better to tread the surface with the feet, and in this case the covering should be increased. At the end of the season some of the plants will have attained to a good size, and in the month of October, the largest of them should be pulled up and transplanted into nursery-rows a foot apart, the plants in the lines being set at 2 inches from each other. At the end of the second year the plants remaining in the seed beds should be all taken up and planted in lines as already stated; and after they have stood for two seasons in the rows, they will be fit to be finally removed.

For Birch trees of this age, pits should be invariably made. The distance at which they are planted from each other is about four or five feet, according to circumstances. In valleys where the soil is good, six, seven, or eight feet may be the distance; but on exposed situations, or in such places where the rough herbage of the surface is to be subdued speedily, they should be planted so close to each other that their leafing will partially exclude the air in Summer time; thus enriching the ground where they grow, which after a few years, when the trees are thinned, will produce a much better pasturage.

This tree should be pruned sparingly. When planted for the sake of its picturesque effect, the knife or pruning hook should not be used—not in any case; and even when reared for the sake of its timber, the operator, whilst detaching a branch, should be well assured that in so doing he has an equivalent either in the air and light admitted to the remaining branches, or in the vigour thrown into the central stem. Few trees are so readily damaged by having their branches removed, as the Birch; and rather than see one *dressed*, with all its side spray cut off, I should much rather recommend that no branch whatever be meddled with.

The proper time for felling the Birch is during the months of winter, and the trees should be immediately removed from the wood to some open situation, where there is a free circulation of air. The wood is only of second-rate importance, though it is used for a great

many purposes, chiefly by turners, coopers, and wheelwrights. It is, however, the *living* object I would specially recommend to the proprietors of Britain, as admirably fitted for the work of improving the condition of the waste and desolate places yet to be met with in our country.

#### THE IMPOLICY OF CHANGING GARDENERS.

THE constant changing of gardeners is ruinous to a garden, and should always be avoided, if possible. Few gardeners are discharged for incompetency or neglect; that would be so certain a result, that a man is unwilling to thrust himself where he knows he cannot answer his master's purpose. Changes then, mostly occur from differences of small importance to the owner or from the influence of others who wish to displace one man to make room for another. If an employer finds his garden well cropped, and the business of the garden well done, he should never complain that he has not things like other people; but if he finds other gardens supply subjects which his own does not, he should remember that the gardener only wants the hint that such things would be acceptable, or order him to grow them, precisely as he would order his hatter to supply a cocked hat instead of a round one, when he wanted a change; he should recollect that it is the gardener's intent to supply that which the employer wants; but it is impossible he should know without being told what that subject is. We speak not of the ordinary supply of ordinary things in season, but of uncommon things, and things out of season. The former comprises the ordinary practice and moderate expense; the latter involves considerable cost, which the gardener would not be warranted in incurring, unless the subjects, when produced, were duly appreciated. One case is as good as a thousand to illustrate this: Lord Saveall has a garden and establishment of very moderate pretensions, and does all things upon a scale of strict economy; looks at the gardener's weekly bills himself, and frequently lectures the man on the necessity of being careful. We can hardly say that he stints the garden for the production of most things in season; but there is nothing forced, and even the vine, as his lordship calls it, has to serve as plant house for geraniums and hard-wooded genera, so that no more firing can be used than will just keep out frost. All things went on smoothly for a time, as the seasons came round all things were in their places, and the establishment well kept up. All things that the family consumed most plentifully, was grown in quantity; that which was never asked for was not grown at all; and the man knowing that he must keep



no more cats than caught mice, kept his ground and crops in good trim, by great industry, and what may be fairly called a short-handed establishment. But Lord Bestall came to see Lord Saveall, and was lavish of his surprise, "What! March here, and no asparagus? Dear me, we have been cutting asparagus ever since February, and our place is not larger than yours." From this exclamation of surprise he went to another; the cucumbers were but just ridged out in the frames—"God bless me," cried my Lord Bestall, "why if these are your earliest cucumbers, you cannot like them, or else your gardener does not know how to grow them. I always begin cucumbers in February; we have a brace always on the first." My Lord Saveall could have said, "You may hang your cucumbers round your neck for me, for we never eat them at all, and only have them at table for our friends, who never look for them earlier than we have them," but he did not. The noble lords visit the vinery, as it was called, but which, in fact, was a range of greenhouses; and here was matter for a fresh burst—"I see you care nothing about grapes here; your gardener must have a happy time of it; what does he find to do? Why I would not give a farthing for grapes when they are dog cheap. We have them before they are seen in the market." Imagine a noble lord, who spared no expense, never, perhaps, saw the garden bills, nor formed an idea of the expense, running out against a man who had the smallest possible modicum of labour and allowance; who had, after close observation, managed to meet all the wants and expectations of his master, and at length succeeding in displacing him for one who knew not half so much, but who had been brought up where labour and money were not spared. Just fancy the new man running up bills for tan, mats, dung, coals, and other matters, and wanting two more hands. In the meantime, my Lord Bestall, who patronized the new gardener, makes frequent calls, keeps his once economical lord up to the mark by encouraging remarks on the improved appearance of the place, and on the prospect of abundant supplies. The gardener who had been thus shouldered out of his place, was more competent to the task than the new one. He only required to be told that an alteration in the system was to take place. He could have forced asparagus, and produced early cucumbers, ripened grapes earlier, and, in short, was equal to anything that was comprised in the profession of a gardener; but he was sacrificed to the mistaken notions of his employer, who seems to have forgotten altogether that according to the expense allowed in the garden, and the articles required by the family, both of which have to be studied by the gardener, the

man directs his operations. The noble lord, however, run into the strange mistake of supposing that his gardener was doing all he could do, instead of all he was allowed the means of doing. The new gardener had grapes earlier, cucumbers and asparagus earlier, bills much larger, and constant wants of something he had not got; and the family discovered, that while all these luxuries were provided, they were often useless, and many of the common vegetables were neglected. The extravagant gardener was dismissed for impudence, when he was remonstrated with about the bad supply of the ordinary produce; the old gardener was sent for, but though in a nursery ground, receiving only fifteen shillings per week, refused to return, whether properly or improperly, is a question which some of his friends decide for him; but, "these reckon without their host." The man may feel that he would be uncomfortable, he may see the difficulty of conducting the business with the limited means which he knows will be his portion after the expectations have been raised by productions out of season, and he may think that such an employer ought to suffer the penalty of his own weakness. In either or all of which cases the man is right. It is impossible then that any employer can do justice to a gardener's capacity, without telling him what is expected and when, and then allowing the means, for if these be limited, the gardener has neither time nor money to waste in anything that is not required, and he will be most prudent who throws away neither. What is the use of cucumbers before you mean to eat and enjoy them? What good is it to have forcing which is expensively conducted, when you do not value the produce? It is not a new case, though a real one, that we have been stating. There are hundreds of such cases of different shades, where the master is set against his gardener by the influence of others, who first persuade him that he has not things like his neighbours, and attribute the deficiency to the gardener, good-naturedly recommending some other and less capable person, who does everything else worse, while he provides some costly novelty that distinguishes him from his predecessor, who would have done it better. Employers, then, have no right to assume that when a thing is undone a gardener cannot do it. His butler brings up port and sherry, or the wine usually drank at table, without any orders, but if the master wants champagne or burgundy, he has to order it. The gardener, who soon learns what a family requires, produces nothing out of the common way, and if an employer wants anything more, he has no right to suppose his gardener, any more than his butler, can know those wants. There are many vegetables al-

together discarded from some establishments: scorezema, cordrons, Jerusalem artichokes, and others; but there are some families in which much of all these are consumed. There are some establishments in which the principals would not give the price of a load of tan or dung for the sake of having cucumbers in January, asparagus in February, or melons in May; and for such people to pay any attention to the boasting of others about their early produce is perfectly ridiculous, and it is more so to blame a gardener for not doing something which without an order he had no right to do. Let an employer, if he fancies strawberries in February, tell his gardener he should like them, and if he cannot in due season produce them, it is time enough to condemn him; and no man ought to allow the interference of a third person, to prejudice him against a man who does his business well; nor should the assertions in newspapers, that this, that, or the other has been done, or ought to be done, weigh a feather in the scale against his servants. It is a good advice to "speak well of the bridge which carries us over safe." It is, in other words, telling us that we ought to speak as we think, and think as we find. If we have a gardener that does all he is required to do, not all the newspapers, nor all the people, ought to be able to prejudice us against him. If we have new wants we should inform him of them, and let him have a chance of supplying them. The longer a man is with us the better he understands us, the more he is unsettled by his discharge, and we by a change. There is nothing to justify the acting upon hearsay; men ought to judge for themselves, and recollecting that none of us are perfection, we should weigh well whether the faults of a man are great enough to afford us a hope of bettering ourselves, before we change our gardeners.

#### GREEN GRAPE WINE.

SUPPOSE a five gallon cask of wine is to be made—take 25lbs. of green grapes (ripe fruit is objectionable) bruise them by degrees, stalks and all, so as to crush every berry and footstalk; put the mass with its juice into an open cask, and pour over them two and a half gallons of pure soft water, stir well, and cover the cask with its loose head and a cloth; agitate the whole twice a day till it appear that fermentation has just commenced; and this may be ascertained by taking a little of the clear liquor in a glass, when a few small air bubbles, or a slight frothiness will be visible. Strain off the liquor, press the pulp, pour on it half a gallon more water, strain and press again. The sugar required will be 15lbs.

Jump, not moist sugar, must be used; or if the party be a bee keeper, we recommend that five pounds of pure honey be just brought to boil with half a gallon of water, all the waxy froth being taken off as it rises. In this case, half a gallon less water should be put on the bruised fruit in the first instance. The honey liquor cooled while the pulp undergoes straining and pressing, no time will be lost; and when both are ready ten pounds of sugar should be put into the expressed juice, to which the solution of honey should be added. Thus there will be about five gallons of a fluid which now will bear the name of stock, two ounces of crude tartar (Argol as it is called), put it into a perfectly sweet five or six gallon barrel; and as soon as the sugar shall be quite dissolved and mixed by stirring, turn the liquor. If a dry wine be chosen, a cask that will contain more than the liquor made is to be prepared. If a sweet wine be required, add half a pound more sugar for each gallon, and let the barrel be full, reserving a little of the clearest must to supply what works over. If fermentation begin vigorously before the sugar be added, it may happen (as we have seen) that on adding the honey, a quantity of brown matter will separate and be thrown rapidly up, forming a head over the liquor; this should be taken off, and strained through a hair sieve, returning the clear fluid to the must. Wine so made, if properly managed during winter, will be good, and quite bright in March. These facts are proved by repeated experiments. Experience has given assurance of the perfection to which British grape wine can be carried. Our first wine has so far mellowed by time; and we can moreover adduce the fact that a party of friends refused every other wine whatsoever, white or red, for several successive days,—one gentleman, recently returned from Germany, and intimately acquainted with the wines of the Rhine, compared ours of 1836, with excellent Töhanisberg. Therefore, although the fruit may not ripen, a sure alternative presents itself, for white wine of the first quality can be made from that which otherwise employed, would be utterly worthless. Twenty-four pounds of grapes crushed on the stalks, with a due proportion of soft river water, one ounce of powdered argol, and a quantity of loaf sugar, sufficient to bring four gallons and a half to the specific gravity of 1.115, well prepared, four gallons imperial measure, of white wine, which in two years (that is, kept one year and a quarter in the wood, and three-quarters in bottle) may surpass any Moselle, and perhaps rival Sauterne or Bucellas. — These are mere general hints, for we do not desire to reiterate, but our particular process

is at the service of readers who may desire to possess themselves of it; in the mean time, one chief object of this communication is to advise persons who have availed themselves of Dr. McCulloch's directions, or those of other practical teachers, that after a first racking off from the gross lees about Christmas, and the second about the following grape season, when a renewed fretting becomes apparent, an ounce or two of coarsely powdered sugary marble put into the cask prior to returning the clear wine into it, and a bottle of the finest Bucellas added to supply the waste of the racking will be found of essential benefit to the wine. Most people use ardent spirits for filling up; the practice is erroneous, it vitiates the liquor, is productive of no one good quality and is expensive. Bucellas is not coltly, it assimilates perfectly with the wine of green grapes, adds quality but not fire, and fulfils the condition insisted upon by the best writers upon British wines, that of "always fill up with wine of a finer quality if possible." It is in vain to attempt an imitation of Madeira or Sherry, without employing flavouring drugs; but Bucellas being the product of a German wine transferred to the west of Europe, assimilates and yields no factitious flavour.—We close here with the advice to lose no time; use every cluster which will not ripen, and let us add to our stock of vines, under the assurance, that if we fail to ripen our fruit, we shall succeed in our vintage.—Written originally for the *Gardener's Gazette*, by Mr. TOWERS.

#### THE ORCHARD.

*To prepare Soil for Apricots.*—The favourable soil for the apricot is a light loam: if the natural soil is a rich loam of eighteen inches deep, dig from a common as much light sandy earth as will spread six inches thick all over the border; to every load of sandy earth add one barrow of rotten dung. If the natural earth is sandy, add one third of rich loam; and to every four loads of loam add one of rotten dung. If the natural soil is gravelly, add one half strong loam, and to every three loads of loam one of rotten dung, and one of rotten wood earth, if it can be got. The composition should be laid on the border and trenched over three or four times that it may be well mixed; the last time should be three weeks before the planting season, that the mould may be well settled before the trees are planted. The Apricot is naturally inclined to shoot strong vigorous wood, especially when the border is rich; dung is pernicious to all trees (vines excepted) but none suffer so much from it as apricots, for it makes them gum and

canker. Apricots should have more room than is generally allowed them; the Turkey kind should never have less than thirty feet, although the wall is twelve feet high, and the other sorts from twenty to twenty-four feet. When the planting season is come, mark out the distances, open the holes, and disperse the mould all over the border. Some time before planting prepare the following composition for that purpose, viz., four barrows of earth from that prepared for the border, one barrow of very rotten dung, and one barrow of light rich black earth; this is the proportion, the quantity must be according to the plantation; it must be well mixed and a barrow and a half laid to every hole. The little quantity of dung used in planting can have no bad effect, it will make the tree push forth fine strong roots the first year.

*To prepare Borders for Peaches and Nectarines.*—Peaches and Nectarines are so much alike in nature, that they thrive very well on the same soil; what is said of one may be understood of both: the right preparation of the borders is very material, as on this the future success depends. Peaches love a strong loam, in which they thrive best, and will come to great perfection. Dung is a great enemy to them, and it causes them to shoot strong rambling wood, which is very detrimental to the trees; it also causes them to gum, and prevents their bearing. If the natural soil is a strong loam, add one inch of very rotten dung, and trench the border over three times. If the natural soil is gravelly, add one half of strong loam, and two inches of rotten dung; if sandy, which is the worst of all soils for Peaches, add three inches of strong loam to one of the natural earth, and one inch of rotten dung; if a fine light rich earth, add one third of a good strong loam. The borders should always be trenched over three times, after the proper mixtures are laid on before planting. The following compost must be prepared for planting: four barrows out of the prepared border, one of light black earth, and one of very rotten dung; one barrow to each hole. The proper distance for Peaches and Nectarines is seldom properly considered; they are in general planted at equal distances, without regard to their growth, though many sorts require a great deal more room than others. The early sorts of Peaches and Nectarines should be planted from fourteen to sixteen feet, the late sort from eighteen to twenty feet. It is a general mistake in planting walls with Peaches and Nectarines to have a great number of sorts, that there may be a variety all the season; six or seven good kinds properly chosen are sufficient to afford plenty and variety during the season. There are many

Peaches so much alike that it is difficult to distinguish them even by good judges of fruit. It is a common practice to plant fire walls with those that seldom come to perfection in England without heat. By this method, it is true, fine fruit may be obtained that cannot be had otherwise, but where there is not a great quantity of walling it is attended with many inconveniences. It is absolutely necessary to allow the trees rest, at least every third year; the late sorts will not then ripen their fruit or wood if the season is not favourable; when that is the case, much of the young wood will be hurt by the frost in winter, and the tree so mangled, that there is often a disappointment upon an increase of the succeeding year. If the walls are all planted with good kinds that are eatable in favourable seasons without heat, by the help of fire they may be brought to the greatest perfection, and in the year that there is no fire, they stand a good chance of ripening their wood if the season is but indifferent.

*The Preparation of Borders for Pears.*—

The most proper soil for all kinds of Pears is a strong loam: when the natural soil is such, add one inch of very rotten dung, and trench the border over three or four times. Sand and gravel are great enemies to all kinds of Pears; on such soil they moss and canker, and never produce good fruit; it is generally stony and has no flavour: where the natural soil is such, there must be added a great deal of loam, and two inches of very rotten cow-dung. If the natural soil is a stiff clay, in that case it will be proper to raise the border eight inches above the level of the ground, which must be with the following materials: coal-ashes sifted very fine, wood earth where leaves and sticks have rotted, soft sand from a pit, and rotten horse-dung of each an equal quantity, to be laid on the clay, and worked over until it is well mixed; in which pears will thrive and produce most excellent fruit. The mould for planting in this stiff border is, one barrow from the border, one of rotten dung, and two of wood earth: this will be fit for the trees to strike root in, after which they will grow very well. No kind of pears should have less room than twenty feet, and many of the more vigorous sorts should have twenty-four or thirty feet distance at least; for when they have little room they grow so full of young wood, and require so much cutting, that they never bear well. The compost for planting with (except the clay border) is, two barrows of the prepared mould, one of rotten horse-dung, and one of light rich mould; put one barrow of it to a hole. Pears are a fine fruit and lasting, if brought to perfection. There are many of the French kinds that are equal in goodness, if not superior, to many

peaches: an agreeable entertainment in the winter months. Those that soonest come to perfection in England are, the winter Boncrétien, the Chaumontel'e, Eas'er Bergamot, Virgoulé, Colmar, Beurré, Crasan, and St. Germain. There are some of the above, viz. the Crasan, Beurré, St. Germain, and sometimes the Colmar, prove tolerably good in fine seasons, but are so inferior to the same kinds in France, that if compared together they would appear a different sort of fruit. By planting them on a fire wall, and giving them a little heat from setting until they are fit to pull, it improves them beyond the conception of those who have not seen the experiment. In small gardens, where the south walls cannot be spared, if the west aspect is flewed, it will answer for pears, and is much better for apricots, the fruit is larger and much better flavoured; cherries likewise are larger and not so subject to vermin as on a south aspect.

*The Preparation of the Borders for Plums.*

—Gravelly light soils are the best for all kinds of plums; they bear high-flavoured fruit in great quantities; they are not so large as when planted in strong earth, but the quantity and richness of the flavour make amends for that deficiency. If the natural soil is a loam, add an equal quantity of poor light sandy mould from a common. If a rich black soil, add one third of sandy loam and one third of poor gravelly earth from a barren common. If the natural soil of the borders is a light sand, add one half of a stronger loam: if the natural soil inclines to clay, it is very unfit for plums; it must be made light or there will be little hopes of success. One half of the earth must be taken out of the border and replaced with light rotten wood earth if it can be got, or with rich black earth: to every load of earth add one of fine small gravel. To all the different soils add one inch of very rotten horse-dung, then trench the whole border over three or four times; the oftener the clay border is worked the better. In all of these preparations plum-trees will thrive and bring their fruit to great perfection. The proper distances for plum-trees are from sixteen feet to twenty; it is much better to have fewer trees and allow them room to spread; they will be the handsomer, and bear a greater quantity and better fruit; for trees that are crowded produce much wood and little fruit.

*To prepare the Borders for Cherries.*—

Cherries thrive best in a fine light rich loam; in such they bear great quantities, and the fruit has a high flavour. If the natural soil be a strong loam, add a large quantity of soft pit sand until it is almost a sandy loam: if a sandy soil they will thrive tolerably well, but if three or four inches of strong loam were

added, the trees would be more vigorous and the fruit much larger; in a sandy soil they will be sooner ripe by ten days than in any other mould: if the natural soil is a light black earth, it will answer very well. If the natural soil is a strong loam inclining to clay, add soft sand, rotten wood earth, or any other light soil to make it light. To all of those different mixtures must be added two inches of very rotten dung, that has been turned several times. The whole must be trenched over three or four times, that the border may be well mixed before planting. The distance for cherries of all kinds is from eighteen feet to twenty-four; this may seem a great distance, but there will be more fruit on one tree that covers twenty-four feet of wall, than there would be on two trees standing on the same length of ground. The only objection that can be made to this great distance is, that it will be some years before the wall is covered; but if the method of training the trees here directed be followed, they will soon cover it: however, to remove that objection, plant standards between, which may run into fruit without any regard to the trees, for they must be cut out as the dwarfs advance. The composition for planting is, four barrows of the prepared mould for the border, to one of very rotten horse-dung. In the composition of the mould for planting, there should be always ready some of the prepared border mould; what is meant by that is, some of the mould of the border, the trees are to be planted in, after it has been trenched and well mixed: this is to be observed in all the different kinds of soils.

**General Remarks.**—The proper soil for an orchard is a fine light loam, they will grow and bear fruit in all good earth that is twenty inches deep, and a dry bottom. Clay, sand, or gravel are very unfit to plant fruit-trees in; for though the ground be well prepared for planting, they soon decay. Walnuts, if planted for fruit, should have a good, light, rich, deep soil. The trees raised in the nursery, that have been removed at least three times, are the most proper; the top-root being destroyed, the side-roots run horizontal, and then they bear great quantities of fine fruit. Chesnuts planted for fruit, should be treated in the same manner as walnuts; but they will thrive in worse ground. Mulberries should be planted on a dry light earth, not too rich; the ground all round them for six yards should be covered with grass; for if it is dug, they never bear any quantity of fruit, and what they do will be very indifferent. Filberts will thrive, and bear great quantities of fruit, if planted on a dry, light, gravelly soil, and the fruit will be much sweeter than the fruit of those planted in rich

or strong land. If the walks in the kitchen garden are of the same soil with the quarters, there is no necessity for the borders to be very broad; but if they are less than ten feet, the walks should be prepared the same as the borders, before the gravel or sand is laid on, which should not exceed four inches. If there is a fruit wall near a mansion, it would be neater to have the gravel laid close to the wall: it will be no detriment to the trees, provided the ground is properly prepared before the gravel is laid on; and once in three years it must be taken up to lay some fresh compost to the trees. The preparing the fruit borders of different kinds, so that each sort of fruit may have its proper soil, is not so great an expense as what is bestowed in the common method of making all the borders in the garden equally good. To keep the trees in heart, and the fruit in perfection, there must be some fresh compost laid on the borders every third year.

#### INJURIOUS INSECTS—NO. VI.

##### The Death's Head Hawk-Moth (*Acherontia Atropos*.)

THIS species is said to be found throughout the whole world, but the differences observable in some specimens from different parts of the globe, although ascribed by some to local influences, are such as to render it questionable whether more than one species are not included under its name. In this country the moth, which is from four to five inches in expanse of wing, is found from June to November. Its antennæ, or *horns*, are much thicker in the middle than at the top, and are somewhat prismatic in shape; its upper pair of wings are of a fine dark grey colour, variegated with yellow, orange, and white; its under pair are of a bright orange colour, each being marked transversely with a pair of black bars; from its waist to the lower extremity, its back has a broad blue grey stripe; on the back of its chest, or thorax, is a mark bearing a rude resemblance to a human skull, or death's head and marrow bones, in pale grey, varied with dull red and black, while the bands lower down look somewhat like ribs. The inhabitants of the West of England, and of some of the French provinces, where it occasionally abounds, think this figure of a death's head on its back is ominous of some approaching calamity. In German Poland, where it abounded in 1824, it is called the death's-head phantom, or wandering death-bird, and the sharp plaintive noise it makes is regarded as a cry of anguish, foretelling war, pestilence, famine, and death to man and beast. It flies either early in the morning, or after sunset in the evening, with a heavy and sluggish mo-

tion, but capable, however, of long continuance. It is not improbable, indeed, that we often receive an increase of numbers owing to some of them flying across the channel from other countries. Stephens records an instance of one of them being captured at sea, four miles from land: and Mr. Couch says, that on "September 29, 1836, the wind blowing strong from the east, one of these moths flew on board a fishing-boat, at about the distance of three leagues from the east coast of Cornwall, and, knocking itself against the mast, fell to the bottom. After being sufficiently examined, it was left to itself, when it again took flight, and, though not in the direct course of the wind, flew away seaward."—(*Charlesworth's Mag. of Nat. Hist.* New Series, i. 224.) Another contributor to the same useful journal, says—"On our passage up the Mediterranean, in H.M. ship *Ingate*, May, 1831, then off the Spanish coast, Cape Pelos being the nearest point, distant about 20 miles, a fine specimen of the death's-head moth flew on board. As the breeze was not overpowering it may fairly be conjectured that it had quitted the shore more from choice than compulsion, and probably might have safely alighted in Africa, had it instinctively sought a warmer climate, which probably was the case, from its having been met with at so early a period of the year." (*Mag. Nat. Hist.*, iv. 436.)—It feeds on the nectar of flowers, and is so fond of honey that it enters the beehive and plunders it to a considerable extent. Bees that have once been invaded by it exhibit considerable sagacity in erecting a thick wall, or barricade of wax and propolis, behind the entrance to their hive, leaving in the barrier some holes just large enough for the admission of one or two bees at a time. Some bees which M. Huber kept, erected such a barrier against it in the year 1804, but they destroyed it in the spring of the following year, and did not rebuild it until the autumn of 1807, when they speedily barricaded themselves again, the death-head moths having re-appeared in great numbers, after an absence of about two years. The caterpillar, when full grown, is as thick as one's little finger, and sometimes nearly five inches in length. Its colour is yellow, interspersed with several slanting stripes of a dark violet, or plum colour. On the last, or anal segment of its body, is a carved horn, which still further induces the ignorant and superstitious to regard it with dread. It is a voracious devourer of potato-tops and white jasmine (*Jasminum officinale*) preferring those two plants to the elder (*Sambucus niger*), and the bitter-sweet (*Solanum dulcamara*) which are supposed to be its natural food in this country. During the day time it remains concealed un-

der leaves, and is not easily found, but at dusk it comes forth to feed, and then, if the plants which are observed to have been partly devoured, be examined by the light of a lantern, this and several other species of insects, may be caught. When ready to transform into a chrysalis, which happens sometimes in July and August, but oftener in September, the caterpillar penetrates rather deep into the soft earth, where it forms for itself a round and smooth chamber, or cavity. Those which entomologists have kept in flower pots have been observed to remain in their chrysalis state from about six to eight weeks.

#### A FEW TERMS USED BY HORTICULTURAL CHEMISTS.

**Acids.**—Compound substances, many of which (but not all) are formed by the union of oxygen with some other substance. Those most important to the agricultural chemist are the Carbonic, Muriatic, Nitric, Phosphoric, and Sulphuric.

**Affinity**, or Chemical attraction; is the power or property by which dissimilar substances unite, and form new substances.

**Air.**—The mixture (without chemical union) of Oxygen and Nitrogen, which forms our atmosphere. It contains also a certain per centage of watery vapour, carbonic acid, and other substances.

**Alkalis.**—A few compound substances which possess the property of changing vegetable blues to green, and readily unite with acids, and thus form salts.

**Amende.**—A French word, signifying "reparation."

**Ammonia.**—An Alkali, composed of the two elements Nitrogen and Hydrogen.

**Assimilation.**—The property by which fresh matter is added to the substance of plants or animals.

**Azote.**—see Nitrogen.

**Calcium.**—An element of a metallic nature, which, united with oxygen, forms lime.

**Carbon.**—An element, which is very nearly pure in the form of Charcoal. United with oxygen it forms carbonic acid. It is a constituent part of all vegetable matter.

**Carbonates.**—Compound substances formed by the union of Carbonic acid with some other substance—as in the following examples:

**Carbonate of Ammonia.**—A salt, formed by the union of Carbonic acid and Ammonia.

**Carbonate of Lime.**—A compound body formed by the union of Carbonic acid and Lime.

**Carbonate of Soda.**—A particular salt formed by the union of Carbonic acid and Soda.

**Carbonic Acid.**—A compound formed by the union of Carbon and Oxygen.

**Chalk.**—Carbonate of Lime, generally very pure, forming a soft white rock.

**Chloride of Calcium.**—A compound of Chlorine and Calcium—otherwise called Muriate of Lime; because it scarcely exists without combining with water, and then it changes its nature to the latter salt; which see.

**Chlorine.**—An element, which under ordinary circumstances, exists as a gas with a greenish tinge. United with Hydrogen it forms the Muriatic or Hydrochloric acid.

**Crude.**—Raw and unaltered.

**Develop.**—The act by which the different parts of organic bodies expand or grow.

**Effete.**—French word signifying worn out or spent.

**Elements.**—Simple substances, of which chemists are acquainted with 56 or 57. Many of them are of a metallic nature; as Gold, Copper, Iron, &c. Some appear under the form of gases, as Oxygen, Hydrogen, Nitrogen, and Chlorine. The Agricultural chemist has to deal with only a few of these elements. The main bulk of all plants consists of only four, viz., Carbon, Oxygen, Hydrogen, and Nitrogen; the latter being present in small proportion.

**Epidermis.**—A delicate skin which coats over the whole surface of plants.

**Exhaltation.**—A peculiar vital property of the leaves, and other green parts of plants; by which water, in the form of steam, is continually discharged (under the influence of light) through minute invisible pores called stomata.

**Function.**—A vital action performed by some part or other of the system. Thus the heart has the function assigned it of keeping up the circulation of the blood. Leaves have the function assigned them of concocting organic matter.

**Gas.**—That peculiar state of matter in which its particles are kept far asunder by mutual repulsion.

**Gum.**—A substance formed in the proper juices of plants, and which serves to nourish and develop them. It consists of Carbon, Oxygen, and Hydrogen, and is one of the simplest forms of organic matter.

**Gypsum.**—The form in which the Sulphate of Lime occurs in nature, viz., as a soft mineral substance. When burnt, the water naturally combined with it is driven off, and it becomes reduced to a powder called Plaster of Paris.

**Herbarium.**—A collection of specimens of dried plants, preserved between paper, for purposes of botanical study.

**Hydrogen.**—An element, the lightest substance in nature, which has never yet been reduced from the state of a gas to that of a liquid. It is a constituent of all vegetables.

**Inorganic.**—See organic.

**Iodine.**—An element, which readily assumes by heat the state of a gas, of a beautiful violet colour. It is obtained from certain sea-weeds.

**Leguminosæ.**—A particular family of plants which includes Beans, Peas, Clover, Lucerne, Saintfoin, &c., &c.

**Lime.**—A compound of oxygen and calcium. This is generally procured by heating some kind of carbonate of lime; and by thus expelling the carbonic acid, the lime is left pure.

**Marble.**—A form of a very compact limestone, *i. e.*, a Carbonate of Lime.

**Muriates.**—Compounds of Muriatic acid and other substances; as the following:

**Muriate of Lime.**—A particular salt, formed by the union of Muriatic acid and Lime.

**Muriatic-acid.**—A compound of Chlorine and Hydrogen, which exists as a gas; but which is readily taken up by water, and then forms the liquid muriatic acid, or "spirits of salt," of the shops.—See Salt.

**Neutralize.**—When an acid combines with an alkali, so that the compound thus formed ceases to possess either acid or alkaline properties.

**Nitrates.**—Compound substances of which Nitric acid is an ingredient. As in the following example:

**Nitrate of Soda.**—A particular salt, formed by the union of Nitric acid and Soda.

**Nitrogen.**—An element, which under ordinary circumstances, appears as a gas. It forms four-fifths of the atmosphere; and in small proportion enters into all plants.

**Organ.**—Any particular part of a plant is so called. Thus the leaf is an organ, the root is an organ.

**Organic.**—Belonging to, or which has belonged to a living body, whether plant or animal. All other forms of matter are termed inorganic.

**Oxide.**—A combination of oxygen with certain substances, and which does not possess acid properties.

**Oxygen.**—An element, which under ordinary circumstances, assumes the form of a gas. It is considered to be the most abundant substance in nature, and to form nearly one-half of the materials of our globe. It is one of the constituents of all plants.

**Parasite.**—A particular description of plant or animal, which derives its nourishment from the substance of some other to which it attaches itself in the living state. Thus the Mistletoe is a parasite on the branches of apple and other trees. A species of Orobanché is a destructive parasite on the roots of Clover.

**Phosphate of Lime.**—The combination of phosphoric acid and lime, which enters largely into the composition of bones of animals.

**Phosphoric-acid.**—A compound of Oxygen and Phosphorus.

**Phosphorus.**—An element which possesses a wax-like appearance and consistency. In the air it slowly unites with oxygen, and appears luminous—when heated, it burns with intense violence, and emits a most brilliant light.

**Physiology.**—The science which treats of the laws by which the different functions of living bodies are performed, whether plants or animals.

**Potash, or Potassa.**—An alkali, formed by the union of oxygen and potassium. The common Potash of the shops is a combination of Potash and Carbonic acid, i. e., a carbonate of Potash.

**Potassium.**—An element which possesses a metallic appearance, but is lighter than water.

**Proper-juice.**—The nutritious fluid, formed in plants out of the crude sap introduced by the roots. It is first formed in the leaves, and thence distributed through the system.

**Respiration.**—The act of breathing in animals. The term is also used to express the decomposition of carbonic acid by the leaves of plants, which separate its carbon, and set the oxygen free.

**Rock-salt.**—Common salt, as it occurs in solid beds in the earth.

**Saline.**—Of the nature of salt.

**Salt.**—This term is applied to many compounds between acids and other substances; as well as to "common salt," which is the Muriate of soda.

**Silicious.**—Composed of the earth called Silica, which is the ingredient of flints, and a variety of other hard stones, characterized by the property of striking fire with steel. Sand is flinty matter in a finely powdered state.

**Soda.**—An alkali composed of Oxygen and Sodium.

**Stoma** (in the plural *Stomata*).—Small invisible glandular pores scattered over the surfaces of leaves; through which the moisture introduced by the root is largely exhaled, or driven off.

**Sugar.**—A substance formed in the proper juices of plants, composed of Oxygen, Hydrogen, and carbon.

**Sulphate of Ammonia.**—A compound of Sulphuric acid and Ammonia.

**Sulphuric-acid.**—A compound of Oxygen and Sulphur, commonly known as oil of vitriol.—Abridged from Professor Hemlow's Letters.

unlike each other. The Crown Imperial is a noble looking plant adapted for large borders, and distant belts of dressed ground. They are seen at a great distance, and are unlike anything else. Miller describes, under the head of *Fritillaria*, ten species; and Paxton, twenty-seven, but it will be a work of practice to show how many of them are seedling varieties, and how many deserve the distinction of species.

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes the plants which have six stamina in their flowers, and but one style. These two genera of *Fritillary* and *Crown Imperial*, have been always separated, till Dr. Linnæus joined them together; indeed by their flowers they may be properly enough placed in the same genus; but, if their fruit may be allowed as a characteristic note, they should be separate, however, Miller joins them together. The alledged species are:—

*Fritillaria (Melagris)* *Fritillary* with narrow leaves placed alternate, and flowers terminating the stalk, called also, early, purple, variegated, chequered Tulip.

*Fritillaria (Aquitania)* *Fritillary* whose lower leaves are opposite, or Aquitain chequered Tulip, with an obscure yellow flower.

*Fritillaria (Nigra)* *Fritillary* with flowers growing above each other, or black chequered Tulip.

*Fritillaria (Lutea)* *Fritillary* with spear-shaped leaves, and one large flower on each stalk, or largest yellow Italian *Fritillary*.

*Fritillaria (Umbellata)* *Fritillary* with flowers growing in umbels, or umbellated chequered Tulip.

*Fritillaria (Persica)* *Fritillary* with a naked spike of flowers and oblique leaves, commonly called the Persian Lily.

*Fritillaria (Racemosa)* *Fritillary* with flowers growing in bunches. Branching *Fritillary*, or smaller Persian Lily.

*Fritillaria (Imperialis)* *Fritillary* with a tufted bunch of leaves over the flowers, which is naked below, and entire leaves. Crown Imperial.

*Fritillaria (Regia)* *Fritillary* with a tufted bunch of leaves over the flowers, which is naked below, and crenated leaves. Royal Crown with crenated Lily leaf.

*Fritillaria (Autumnalis)* *Fritillary* with a naked stalk, and oblong pointed leaves.

The first sort grows naturally in Italy, and other warm parts of Europe; and from the seeds of this there have been great varieties raised in the gardens of the florists, which differ in the size and colour of their flowers; and as there are frequently new varieties produced, so it would be to little purpose to enu-

## FRITILLARIA AND THE CROWN IMPERIAL.

THESE plants have been jumbled together very singularly, for some of the sorts are very



merate those which are at present in the English and Dutch gardens, which amount to a great number in the catalogues of the Dutch florists, who are very fond of any little distinction, either in the colour or shape, to enlarge their lists.

"The sorts which are here enumerated," says Miller, "I think may be allowed as distinct species, notwithstanding Linnæus has reduced them to five; for I have raised many of all the sorts from seed, which have constantly produced the same as the seeds were taken from, and have only differed in the colour or size of the flowers; for the sort with broad leaves produced the same sort again, and the umbellated and spiked sorts produced the same, though there are several varieties in the colours of their flowers."

The first has a round compressed root, in shape like that of Cornflag, but is of a yellowish white colour; the stalk rises about fifteen inches high, having three or four narrow long leaves placed alternately, and the top is divided into two slender foot-stalks which turn downward, each sustaining, one bell-shaped inverted flower, composed of six petals, which are chequered with purple and white like a chess-board; and in the centre is situated a germen supporting one style, crowned by a trifid stigma; the six stamina stand about the style, but are shorter. At the bottom of each petal there is a cavity, in which is situated a nectarium, filled with a sweet liquor; after the flower is fallen, the germen swells to a pretty large three-cornered blunt capsule, and then the foot-stalk is turned and stands erect; when the seeds are ripe, the capsule opens in three parts and lets out the flat seeds, which were ranged in a double order. The flowers of this appear the latter end of March or beginning of April, and the seeds are ripe in July. There is a variety of this with a double flower.

The second sort grows naturally in France, the leaves of this are broader, and of a deeper green than the former; the lower leaves are placed opposite, but those above are alternate; the stalk rises a foot and a half high, and is terminated by two flowers of an obscure yellow colour, which spread more at the brim than those of the first sort, but are turned downward in the same manner. This flowers three weeks after the first. There is a variety of this with greenish flowers, which grows naturally in some parts of England.

The third sort seldom rises more than a foot high, the leaves are narrow like those of the first sort, but are shorter; each stalk is terminated by three or four flowers, which arise above each other; they are of a very dark purple, chequered with yellowish spots.

This flowers in April, about the same time with the second.

The fourth sort rises about a foot high, the stalk is garnished with spear-shaped leaves four inches long and one broad, of a grass green colour: these are sometimes placed opposite, but are generally alternate; the stalk is terminated by one large bell-shaped flower of a yellowish colour, chequered with light purple. This sort flowers about the same time as the first. There are two or three varieties of this, which differ in the size and colour of their flowers and the breadth of their leaves, but retain their specific difference, so as to be easily distinguished from the other sorts.

The fifth sort rises a foot and a half high; the stalk is garnished with shorter and broader leaves than the first sort, which are of a greyish colour; the flowers are produced round the stalks like those of the Crown Imperial; they are of a dark purple colour, chequered with a yellowish green. This flowers about the same time with the second sort.

The sixth sort is commonly called the Persian Lily, and is supposed to grow naturally in Persia, but has been long cultivated in the English gardens; the root of this sort is round and large, the stalk rises three feet high; the lower part of it is closely garnished with leaves which are three inches long, and half an inch broad, of a grey colour, standing on every side of the stalks, but are twisted obliquely; the flowers grow in a loose spike at the top of the stalk, forming a pyramid; they are shaped like those of the other species, but are much shorter, and spread wider at their brims, and are not bent downward like those. They are of a dark purple colour, and appear in May, but are seldom succeeded by seeds in England, so are only propagated by offsets.

The seventh sort has a much shorter stalk than the last, but is garnished with leaves like those, only they are smaller; the stalks branch out at the top into several small foot-stalks, each sustaining one dark-coloured flower. This is commonly called the small Persian Lily, from its resemblance to the former sort. These plants are propagated either by seeds, or offsets from the old roots; by the first of which methods new varieties will be obtained, as also a larger stock of roots in three years, than can be obtained in twenty or thirty years in the latter method.

Having provided yourself with some good seeds, saved from the fairest flowers, you must procure some shallow pans or boxes, which must have some holes in their bottoms to let out the moisture; these you should fill with light fresh earth, laying a few potsherds over the holes, to prevent the earth from stopping

them; then, having laid the earth very level in the boxes, &c., you must sow the seeds thereon pretty thick, covering it with fine sifted earth a quarter of an inch thick. The time for sowing the seed is about the beginning of August, for if it be kept much longer out of the ground it will not grow; then place the boxes or pans where they may have the morning sun until eleven o'clock, observing, if the season proves dry, to water them gently, as also to pull up all weeds as soon as they appear; for if they are suffered to remain until they have taken deep root into the earth, they would draw the seeds out of the ground whenever they were pulled up. Toward the latter end of September you should remove the boxes, &c. into a warmer situation, placing them close to a hedge or wall exposed to the south; if they are sown in pots, these should be plunged into the ground, but they are best in tubs; these should be covered in severe frost. In this situation they may remain until the middle of March, by which time the plants will be come up an inch high; you must therefore remove the boxes, as the weather increases hot, into a more shady situation; for while the plants are young, they are liable to suffer by being too much exposed to the sun: and in this shady situation they may remain during the heat of the summer, observing to keep them clear from weeds, and to refresh them now and then with a little moisture; but be careful not to give them much water after their leaves are decayed, which would rot their roots. About the beginning of August, if the roots are very thick in the boxes, you should prepare a bed of good light fresh earth, which must be levelled very even, upon which you should spread the earth in the boxes in which the small roots are contained, equally covering it about one fourth of an inch thick with the same fresh earth: this bed should be situated in a warm position, but not too close to hedges, walls, or pales, which would cause their leaves to be long and slender, and make the roots weaker than if placed in a more open exposure.

In this bed they may remain until they flower, which is generally the third year from sowing, at which time you should put down a mark to the roots of all such as produce fair flowers, that at the time of taking them out of the ground (which ought to be soon after their green leaves are decayed) they may be selected into a bed amongst your old roots of this flower, which, for their beauty, are preserved in the best gardens; but the other less valuable flowers may be planted in the borders of the parterre-garden for their variety, where, being intermixed with other flowers of different seasons, they will make a good appearance.

The fine sorts of this flower should remain

undisturbed three years, by which time they will have produced many offsets; and should be taken up when their leaves are decayed, and planted into a fresh bed, taking such of their offsets as are large enough to produce flowers to plant in the flower-garden; but the smaller roots may be planted into a nursery-bed, until they have obtained strength enough to flower; but you must never suffer these roots to lie out of the ground when you remove them, but plant them again immediately, otherwise they will perish.

During these three years the surface of the earth should be stirred every autumn with a trowel, observing not to go so deep as to bruise the root, and at the same time lay a thin cover of very rotten dung or tanner's bark upon the surface of the beds; which, being washed into the ground, will cause the flowers to be larger, as also the roots to make a greater increase: you must also observe to keep them constantly clear from weeds, and those roots which you would preserve with care, should not be suffered to seed.

When a stock of good flowers are obtained, they may be preserved and increased in the same manner as other bulbous rooted flowers, which is by offsets sent out from their roots, which should be taken off every other year from the finest sorts. These roots may be treated in the same manner as tulips, and other bulbous rooted flowers, with this difference only, that the roots will not bear to be kept out of the ground so long; therefore, if there should be a necessity for keeping them out of the ground any time, it will be best to put the roots into sand to prevent their shrinking.

As the flowers come out early in the spring, they make a pretty appearance in the borders of the pleasure-garden, where they are planted in small clumps; for when they stand single in the borders, they make but a poor figure.

The eighth sort of the Crown Imperial, which is now very common in the English gardens, and is the principal one now cultivated to any extent. This grows naturally in Persia, from whence it was first brought to Constantinople, and about the year 1570, was introduced to these parts of Europe; of this flower there are a great variety now preserved in the gardens of florists, but as they have been produced accidentally from seeds, they are but one species.

The common Crown Imperial; this is of a dirty red colour. The yellow Crown Imperial; this is of a bright yellow. The bright red Crown Imperial, called Fusai. The pale yellow Crown Imperial. The yellow striped Crown Imperial. The large flowering Crown Imperial. The broad-leaved late red Crown

Imperial. The double and triple-crowned Crown Imperial. The double red Crown Imperial. The double yellow Crown Imperial. The silver striped-leaved Crown Imperial. The yellow striped-leaved Crown Imperial.

There are some few other varieties which are mentioned in the catalogues of the Dutch florists, but none which deserve any distinction.

The Crown Imperial has a large scaly root of a yellow colour, and a strong odour of a fox; the stalk rises to the height of four feet or upward; it is strong, succulent, and furnished two thirds of the length on every side, with long narrow leaves ending in points, which are smooth and entire; the upper part of the stalk is naked, a foot in length; then the flowers come out all round the stalk upon short foot-stalks, which turn downward, each sustaining one large, spreading, bell-shaped flower, composed of six spear-shaped petals; at the base of each petal is a pretty large cavity, in which is situated a large white nectarium, filled with a mellow liquor. The flowers hang downward, and above them rises a spreading tuft of green leaves, which are erect, and from between these come out the foot-stalks of the flowers. This plant flowers the beginning of April, and the seeds are ripe in July.

The sort with yellow flowers, that with large flowers, and those with double flowers, are the most valuable; but that which has two or three whorls of flowers above each other, makes the finest appearance; though this seldom produces its flowers after this manner the first year after removing, but the second and third year after planting, the stalks will be taller, and frequently have three tier of flowers, one above another, which is called the Triple Crown.

As this is one of the earliest tall flowers of the spring, it makes a fine appearance in the middle of large borders, at a season when such flowers are much wanted to decorate the pleasure-garden: but the rank fox-like odour which it emits, is too strong for most people.

This may be propagated by seeds, or offsets from the root; the first is too tedious for most of the English florists, because the plants so raised are six or seven years before they flower; but the Dutch and Flemish gardeners, who have more patience, frequently raise them from seeds, so get some new varieties, which rewards their labour.

The common method of propagating them here, is by offsets sent out from the old roots, which will flower strong the second year after they are taken from the roots; but in order to have plenty of these, the roots should not be transplanted oftener than every third year, by

which time each root will have put out several offsets, some of which will be large enough to flower the following year, so may be planted in the borders of the flower-garden, where they are to remain; and the smaller roots may be planted in a nursery-bed, to grow a year or two according to their size.

The time for taking up these roots is in the beginning of July, when their stalks will be decayed; and they may be kept out of the ground two months, but they should be laid single in a dry shady room, but not in heaps, or in a moist place, which will cause them to grow mouldy and rot. The offsets should be first planted, for as these are small, they will be apt to shrink if they are kept long out of the ground.

As the roots are large, they must not be planted too near other flowers; and when they are planted in beds by themselves, they should not be nearer than a foot and a half in the rows, and two feet row from row; they should be planted six inches deep at least, especially the strong roots; they delight in a light soil, not too wet, nor very full of dung; therefore, if any dung is laid upon the borders where they are planted, it should be buried pretty deep, so as to be two or three inches below the bulbs.

The ninth and tenth sorts grow naturally at the Cape of Good Hope, from whence they were brought into the European gardens. The ninth has been many years an inhabitant, where it has been usually titled *Corona Regalis*. This has a tuberosé root, from which arise in the autumn six or eight obtuse leaves, near five inches long and two broad towards the top, growing narrower at their base, and are crenated on the borders, lying flat on the ground; these continue all the winter; in the spring rises the flower-stalk in the centre of the leaves, about six inches high naked at the bottom; but the upper part is surrounded by bell-shaped flowers, composed of six greenish petals. This flowers in April, and the leaves decay in June.

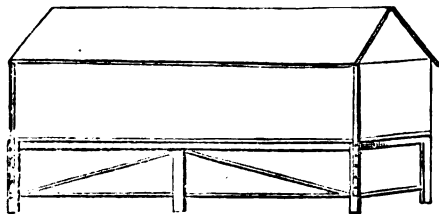
The second sort was raised from seeds, which were sent from the Cape of Good Hope; the root of this is like that of the ninth sort, but the leaves are more than a foot long, broad at their base, but are narrowed to the top, where they end in acute points; the flower-stalk rises rather higher than that of the ninth, but the flowers are of the same shape and colour; this seldom flowers till August. The roots of this sort says Mr. Miller were stolen out of Chelsea garden the following spring after it had flowered, and were sold to some persons whose love for rare plants exceeded their honesty.

It has already been mentioned of the Crown

Imperial, that it has an unpleasant smell. This banishes it in most cases to those portions of a garden which are mostly viewed from a distance, but taking its season of bloom, and the handsome form of the plant into consideration, there are few things better deserving a place in large establishments.

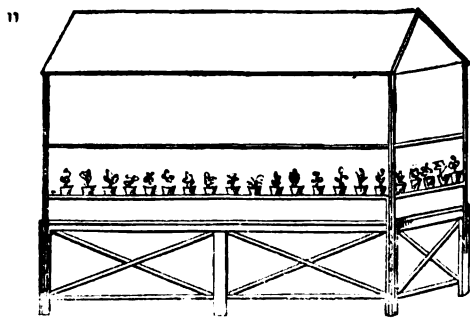
#### WINTERING CARNATIONS.

I SEND for your inspection four sights of a Carnation or Aricula stand for the winter in small pots, and will take twelve large blooming pots in the spring, with a top to protect them at night. Plan A represents the stand as

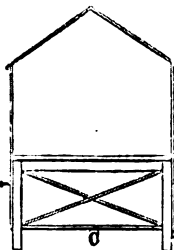
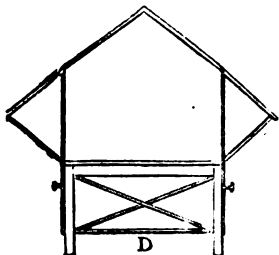


A

closed in bad weather: plan B the top lifted up 12 inches above the plants to give air



in bad weather; and plan C end view as closed, and D as let down on the stand with



the side propped open within. If you think well to publish the same in the *Florist*, and the dimensions for the whole of the work, are as follows:— Make a stand with six legs, rails,

and braces, as the plans; next make a box for the plants to fit inside the stand, eight inches deep, down to the bottom of top rails and spars crossways, to carry the pots; next make a frame, with top like a roof of an house, and made light to lift up to give air as shown, and pinned at the corners into the post any height you think well. The side to open as shown and propped out; the top or shifting frame to be made just to fit outside the posts of stand, and the four corner pieces long enough to pin them when lifted up—this light frame to be covered with a waterproof material. I remain, &c.  
W. H. GREEN, Walton Street.

#### COMMUNICATIONS.

**SALVIA PATENS.**— The richness and variety of colouring observable in the numerous species of *Salvia* which adorn the mountains of South America and Mexico, have long been known to botanists, but it has happened that few of them have hitherto found their way into our gardens. The *S. splendens fulgens*, *Grahami*, and *Mexicana* occupy, it is true, the place in our collections they so well deserve; and some few others of considerable beauty, such as *S. leucantha*, *leonuroides*, *angustifolia*, &c., are to be met with occasionally in botanical gardens. It will, therefore, excite some surprise that this plant, growing plentifully in the same districts from whence we have received the *S. fulgens*, should never till now have been transmitted to this country; and it will be readily believed that there are yet many which would amply reward the exertions of future collectors. We know, for instance, of a *Salvia longiflora* among the Peruvian mountains, with a corolla above five inches long; a *S. speciosa* in the same country, with long dense spikes of a rich purple; a white-flowered *S. leucocephala*, said far to exceed the beauty of *S. leucantha*; and, in the Mexican mining districts, the *S. Regala*, *Sessei*, and *pubescens*, with their inflated scarlet calyxes, *S. phœnicea* covered with a profusion of flowers of the same colour, are stated to be fully equal to the *S. fulgens* in their general appearance; and even in South Brazil it is probable that *S. persicifolia*, or some others allied to it, may fairly enter into competition with *S. splendens*. Others are known to have orange or yellow flowers, of different shades. Indeed, out of nearly two hundred species of American *Salvias*, there seems reason to believe that three-fourths of them may be worthy of cultivation. We may hope, however, that in the *S. patens* we have now secured one of the most desirable of the group, more especially as there seems reason to believe that it is not more tender than

*S. fulgens*. It comes from the same mining districts of Guanaxuato, Real del Monte, Tlalpuxahua, &c. It was there first discovered by Nee, a Spanish botanist, who gave it the name of *S. grandiflora*; but that name having been pre-occupied, Cavanilles published it from Nee's dried specimens and coloured figure, under the name of *S. patens*. Humboldt and Bonpland again brought dried specimens to Europe; and Kunth, not aware of Cavanilles' figure, called it, in his *Nova Genera*, *S. spectabilis*, for which he afterwards, in his *Synopsis*, substituted Cavanilles' name, since adopted by botanists. The *Salvia patens* is a perennial, growing to the height of two, three, or four feet, erect and hairy. The leaves are large, ovate, or deltoid, broadly hastate, or somewhat heart-shaped at the base, or the upper ones rounded, green and hairy on both sides. The flowers are disposed in long terminal racemes, usually branching into three at the base; along this raceme they are placed in opposite pairs, each one at the axilla of a small linear-lanceolate floral leaf. The flower-stalks are short; the calyx half to three quarters of an inch long, hairy, green, and deeply divided into two lips—the upper one entire, the lower deeply two-cleft. The corolla, of a rich blue, between two and three inches long, is remarkable for its broad, gaping-mouth; the upper lip being long, falcate, and erect, enclosing the stamens and pistil; the lower lip hanging, with two lateral oblong reflexed lobes, and the middle one very broad and emarginate. The *S. patens* will probably thrive best under the same treatment as that which succeeds with *S. fulgens*; and, like that plant, it will be found to vary much in the size, the brilliancy, and the number of flowers, according to the temperature and light in which it is grown. Particular care should be taken not to weaken the plant, or suffer it to become etiolated, in order that the raceme may not lengthen too much, and increase the distance between the flowers. We owe this splendid addition to our gardens to the exertions of John Parkinson, Esq., her Majesty's Consul at Mexico, who transmitted seeds to this country early in the present year; and it was raised and first flowered in August last by Mr. W. B. Page, nurseryman, at Southampton. It has also been raised by Messrs. Low, nurserymen, of Clapton, and by Mr. Pontey, nurseryman, at Plymouth.—G. BENTHAM, *Hort. Trans.*

**POTATOES AND BROCOLI.**—It may be useful to country gardeners to be informed that after young potatoes are cleared from the rows, and the ground well dug in the form of shallow trenches, and manured, it will be advantageous to transplant spring brocoli plants in the tren-

ches. This vegetable flourishes greatly after the potato—as does also wheat upon a larger scale in farming. The excrementitious matter of the flax plant, and also that of parsnips, is equally favourable with the potato to a good crop of wheat, if sown soon after they are generally removed.—H. H.

#### SCIENCE EDUCATION AND RELIGION, BY THE DEAN OF YORK.

*"If any man among you seemeth to be wise in this world, let him become a fool that he may be wise. For the wisdom of this world is foolishness with God."*

THE vanity of human wishes and of human pursuits has long been a fertile subject of remarks to writers both ancient and modern. A Roman poet has enumerated all the objects which ever have, or ever are likely to be pursued by man, and he has proved that not one of them is worthy of pursuit. That writer had never heard of the kingdom of heaven, and therefore he knew not where only to direct the efforts of man's rational hope. We might easily agree with him that honours and titles are empty sounds—that they please for a moment, and bring no permanent or solid satisfaction to the heart. Experience has shown that wealth is usually employed to administer to luxury, to selfishness, to pride, and more often leads to evil than to good. But if wealth and honour are of dubious value, we must press upon the youthful mind that wisdom and learning can never be too highly estimated. "Happy is the man," says Solomon, "that findeth wisdom." The fear of the Lord is the beginning of such wisdom, but men seldom pursue that heavenly knowledge. It is to know and understand the things of earth that youth covets education, and that mature age spends hours and days and years in constant and laborious contemplations. The public mind in this kingdom, and particularly in this place, is agitated and occupied with schemes for diffusing the benefits of education. May we not, then, wisely inquire if such universal diffusion of knowledge is certain to increase the happiness of man, and whether there may not be a line that it should not pass. How little does knowledge of earthly things benefit or advance eternal objects. It too often fills the heart with pride,—that universal weed, and makes the little pigmy called man to fancy himself a giant, able to assail the throne of Jove. We know that we can stay on earth but a little while. Let not the pursuits of the vain, unproductive objects of human wisdom employ those hours of reflection, in which the hope

of heaven might be confirmed. Worldly studies, if kept subservient to the higher interests of eternity, exercise the understanding, and teach it more thoroughly to appreciate the works of the great Creator; but, alas! a little progress in science—a little pre-eminence in literature—fills the mind with a lofty notion of its own superiority, and makes man indisposed to receive that doctrine, which proves him to be but an atom of the universe—the creature of an hour. How is it that so many men of learning and of deep thought have been opposed to Christianity? It was pride—the pride of superior talents, which made them refuse to hear proofs, or to suffer conviction to enter into their minds. How careful, then, should we be, in directing the studies of youth, to impart to them a knowledge of heavenly things. Without that, all human knowledge is not only useless, but absolutely injurious. It puffs up that poor weak creature man—persuades him that he is superior to the fading creatures that surround him—and thus operates in direct opposition to that religion, the characteristic, the peculiar characteristic of which is humility.

#### LIMESTONE MANURE.

At the British Association, Mr. W. Lucas read an interesting paper on the Limestones of Yorkshire, an analysis of which was made at the request of the Local Committee. He stated, that,—At the suggestion of Mr. Harcourt and Professor Phillips he had undertaken the task, and had endeavoured to ascertain, by means of chemical analyses, the constituents of the principal limestones of the county, more especially in regard to their application to agricultural purposes. With this object in view, he had procured specimens of the different limestone formations of Yorkshire from those localities where they are burnt into lime, especially for agricultural purposes, and had found that they comprehend the following varieties in an ascending series, viz.:—

1. The mountain limestone of Craven and the North of Yorkshire.
2. The magnesian limestone, both the upper and lower beds.
3. The oolitic limestone of Malton, and known as the lower oolite.
4. The chalk of the Wolds of East Riding.

In these four classes were included all the principal limestone formations connected with the present subject, and he should endeavour to give as concise an account as possible of their properties and constitution, commencing with the mountain limestone. This formation, which is of vast extent, is generally of a

darkish grey, or greyish brown colour, containing innumerable qualities of organic remains. According to the modifications it undergoes, arising from its assuming a more or less crystalline form, and its freedom or otherwise from colouring matter, it presents us with all the beautiful varieties of marble, from the perfectly black marble of Derbyshire to the pure and unsullied marble of Italy. This limestone is hard and semibrittle, and is an excellent material for making roads. When broken, it presents a sharp and somewhat conchoidal fracture, and a semicrystalline texture. On being exposed to the requisite degree of heat, it burns into a very pure white lime. The mountain limestone, on being submitted to analysis, was found to contain 98½ per cent. of pure carbon of lime. In the south-west part of the country, a considerable quantity of lime from the mountain limestone of Derbyshire, is used for agricultural purposes. Its general appearance is identical with the Yorkshire limestone, and on being analysed it is found to contain 98 seventenths of carbon of lime. These analyses prove that the mountain limestone affords the largest proportion of pure lime, and justify the opinion long entertained by agriculturists in its favour. The position of the lower magnesian limestone, in the ascending order is in immediate succession to the millstone grit. It is a yellowish white colour, arising from a slight impregnation of peroxide of iron, and is somewhat granular in texture, and easily broken. Its formation is of very limited extent, compared with the mountain limestone. It is found, however, to extend in a direct line through the country, and is particularly well developed between Doncaster and Conisbro', (where it is worked to a considerable extent,) and in the neighbourhood of Castleford. The Conisbro' limestone, on being analysed, appeared to be a true species of dolomite, consisting of one proportion of carbonate of lime (62.50), and one of carbonate of magnesia (36.75), and consequently not generally applicable for agricultural purposes, although in some cases, and in small proportions, it may probably be occasionally employed, not only without detriment, but possibly with advantage. The Wheldon limestone, belonging to the same formation, is of a yellowish colour, and of a friable earthy texture, interspersed with a species of semicrystalline matter. It contains carbonate of lime 62.32, and carbonate of magnesia 36.22, being identical with the Conisbro' lime, and unfit for agricultural purposes, it however makes an excellent lime for building hothouses, and has the peculiar property of setting well under water.—Immediately above the last formation alluded to,

we have the upper magnesian limestone, which is well developed in the neighbourhood of Brotherton and Knottingley.

This limestone varies as much in appearance as it does in composition from the preceding species. It is found in thin beds or laminæ, and is of a brownish grey colour, rather hard, and breaks with a species of conchoidal fracture, occasionally with a semicrystalline appearance. Having been analysed, it was found to contain 93½ per cent. of carbonate of lime, with scarcely a trace of magnesia. This limestone is, therefore, perfectly applicable to agricultural purposes, and only differs from the mountain limestone in containing a smaller amount of carbonate of lime, and a larger proportion of foreign matter, and that only in a slight degree.—The next formation of limestone series is that known as the lower oolite, and is found in the neighbourhood of Malton, and other parts of this country. It is of a yellowish white colour, and appears to be composed of numberless small round distinct particles, similar to the roe of fish, from which it has received its name of roestone. On being analysed, it was found to contain no less than 97.88 per cent. of carbonate of lime. It is, therefore, well adapted for agricultural purposes, and is the more valuable, inasmuch as it is found in localities at a great distance from those districts which possess the mountain limestone. The chalk formation is developed to a considerable extent in the east part of this county, and forms that peculiar feature known as the Wolds of Yorkshire. On analysing a specimen from Hunmanby, it was found to contain 97½ per cent. of carbonate of lime. Another specimen from Hessele contained 98.42. It appears, therefore, that this limestone also affords an excellent supply of lime for agricultural purposes, and as it is, like the oolitic limestone, is met with in districts far removed from the mountain limestone, its value is thus considerably enhanced.

#### NATURE AND PROPERTIES OF GUANO.

MR. WARRINGTON introduced a discussion at the Chemical Lecture of the British Association, which elicited an interesting enquiry. He said owing to the enormous quantities of this manure now imported, and the extensive application of it both for agricultural and chemical purposes, it became a matter of importance that the different kinds of the article should be analyzed, so that their real value might be known. According to the analyses which had been made there were present uric acid, urate of ammonia, and a certain amount of ammoniacal salts. One kind would yield from 24 to 26 per cent. of ammonia. The or-

dinary analyses of guano, however, did not give the proportion of nitrogen which they ought to do. It was the nitrogen that existed in guano, which, by exposure to the air, was converted into ammonia, so valuable to the agriculturist. He was not, however, prepared to state what those compounds were which contained the nitrogen in guano. Mr. W. then exhibited a specimen of African guano, and said that a curious change takes place in it. After a time it becomes entirely covered with pearly crystalline filaments.

Professor DAUBENY fully agreed with Mr. Warrington that guano should be estimated according to the quantity of nitrogen which it contained. If the nitrogen was not converted into ammonia, we know that it is in a fixed state, and that when it is laid upon the land, it will afford that important ingredient which plants require. It had been a question whether, if plants were supplied with all the ingredients they require, they would not vegetate as well, although the nitrogeneous ingredients were not given, as we know that ammonia exists in the atmosphere, and that they would obtain it from that. He admitted that they would obtain ammonia in the course of time, but it was a question whether they would obtain it so soon as was required.

A GENTLEMAN.—It appears that chemists have not given the agriculturists that information which is desirable relative to the analysis of nitrogen. It was well known that in dry summers the crops were burnt by the application of guano.

Dr. PLAYFAIR thought that by mixing charcoal and gypsum, when there was reason to expect that the summer would be dry, beneficial results would follow. The charcoal would absorb the moisture, and the gypsum would fix the ammonia.

MR. WARRINGTON—The guano should be damp before it is applied to the soil.

MR. JENNINGS—It would be very difficult to scatter the guano properly if it was damp. In one instance I found it requisite to mix the guano with sea sand.

MR. WARRINGTON explained. He did not mean that the guano should be wet, but that it should not be dusty, otherwise it would be likely to be wasted. After guano had been kept for a length of time, particularly that from South America, it became very fine and dry, and in that state a great deal of it was lost.

MR. HUNT had found that by being exposed twenty-four hours to the air, guano lost three, four, or even five per cent. of volatile matter.

A GENTLEMAN—Will any person tell us which is the best, Peruvian or African guano, as there is a wide difference in the price?

A GENTLEMAN—The Peruvian is worth

twice as much as the African, according to my experiments. We may, however, increase the fertility of the soil, until we obtain a much larger quantity of grain, than the straw will support. It is possible to give that additional stiffness to the straw by furnishing silicated alkalies, which is required to rear heavier crops of grain.

Mr. SOLLY—In the part of Norfolk where I live, we have felt very much the necessity of an answer to the question which has just been put.

Dr. PLAYFAIR—There have been many experiments with silicate of potas, but it is exceedingly difficult to get quit of the caustic alkali. In dry weather, it is difficult to make the silicate of potas soluble, as it exists in the soil. I think it might be made an article of commerce, if farmers would try experiments with it.

Mr. JENNINGS—Unless we have the analysis of the soil, all experiments with guano are perfectly useless.

Sir J. JOHNSTONE—This year I have made some experiments with guano, and have also given a quantity of it to farmers for application to soils a certain distance from each other, but all the same formation, and I have found that in proportion as they took the greatest trouble in reducing the causticity by mixing up the guano with sand the experiments succeeded, or the contrary.

Mr. SPENCE (of York)—I hoped to have obtained some decided information at this meeting respecting guano, and I confess I am somewhat disappointed. There are some able chemists present, but they have not expressed a decided opinion on the subject of nitrogen when existing in the form of uric acid, and when existing in the form of ammonia. The African specimens of guano contain very little uric acid, whereas the Peruvian specimens contain a large quantity. During the last year I analysed upwards of two dozen samples of hay; many of them of the best kind, and others of an inferior description. I was anxious to discover if the value of land could be ascertained by the quality of the produce. I found almost universally that the best samples were those which contained larger quantities of potas than of soda. The number of analyses performed led me to the conclusion that plants cannot take up this or that alkali supplied by the soil, but that they will take up certain alkalies. Mr. Spence then inquired whether potas can be replaced by soda, and also whether it is possible to replace the silicates so as to strengthen the straw of plants.

Professor LIEBIG—Soda can replace potas, but in no case common salt. I do not, however, think the silicates furnished by nature could be replaced.

Mr. SPENCE—Have experiments been made on agricultural plants, particularly on samples of hay, as it is important we should know whether such samples contain potas and soda invariably, and whether the best samples contain potas in the largest quantity?

Professor LIEBIG—I do not believe that there is any plant without potas. We have no plant in which there is no potas, but we have plants on the continent in which there is not a trace of soda. Now it is certain that if we find soda in a plant, that soda has replaced a certain quantity of potas. After analyses of blood and milk, we found potas predominant in milk, and soda in the animalcules of the blood. The analyses showed that all plants required as much potas as is necessary for the formation of milk, and as much soda as is necessary for the formation of the animal liquid.

A GENTLEMAN—The question respecting guano has not yet been answered, as to whether the fact of there being a greater quantity of uric acid in one particular sample renders it as much more valuable as the market price seems to indicate. May I ask, also, whether we may rely upon any of the artificial guanos as being equally beneficial to us?

Professor LIEBIG—We have had no experiments relative to the action of uric acids. On all our farms, uric acid has never been used as uric acid. To suppose that Peruvian guano is more valuable because it contains more uric acid is pure assumption. We know nothing about the action of uric acid.

#### THE FLORA OF YORKSHIRE.

MR. MOORE read a memoir on this subject, at the British Association, which had been drawn up by himself and Mr. Baines, at the request of the Council of the Yorkshire Philosophical Society. He commenced by noticing the fact that four years had elapsed since the publication of the Flora of Yorkshire by Mr. Baines; as regards which excellent and copious work this report was intended as a means of indicating the species and varieties, noticed since its appearance. The number of Yorkshire plants (including flowering plants and ferns) noticed in the report were 1,117 species and 158 varieties, many of which latter are considered species by some botanists, exclusive of a few doubtful species, as regards their occurrence in this county. 87 species and 81 varieties have been noticed by botanists, as occurring in Yorkshire, which had not appeared in any general list. He regretted that owing to the shortness of the time allowed for its completion, it might not be so perfect as it otherwise might have been, especially as regards plants peculiar to the sea coast. He alluded to the names of several botanists, through



whose assistance he and Mr. Baines had been able to render the list so full as it was. In the enumeration these plants were classified thus:—

	Species.	Var.
Exogens ..	806 ..	102
Endogens ..	262 ..	35
Acrogens ..	49 ..	21
	<hr/> 1,117	<hr/> 158

The list was then cursorily gone through, and the most remarkable species noticed. Mr. Moore stated that he would not trouble the audience with enumerating all the different species that the report contained, for it would be too tedious, but he would read the names of a few which had only been recently discovered. Mr. Moore then read the names of the several new species, and the state of the ground they had grown on, and the different localities in which they were discovered. He particularly mentioned Doncaster, Otley, Fountain's Abbey, Middleton, Teesdale, Richmond, Sedborough, Wensleydale, Halifax, Coverdale, near Scarbro', Settle, Poppleton, Hawkswell Moor, Knavesmire, Askham Bogs, Heslington Fields, Stockton Common, Cantley, Hebden Bridge, Castle Howard Park, and York. The following are a few of the rare plants recently noticed in the neighbourhood of York, and alluded to in the list:—*Veronica triphyllos*; *V. Buxbaunici*; *Rumex pratensis*; *R. aquaticus*; *R. palustris*; *Juncus Obtusifolius*; *Papaver Rhæas* B.; *strigosum*; *Atriplex detoidea*; *Che-nopodium murale*; *Polygonum mite*; *Lolium multiflorum*; *L. perenne* B.; *Potamogeton plantaginleas*; *P. oblongus*; *Alyssum calycinum*; *Carex paradoxa*, &c. Mr. Moore particularly alluded to a dwarf variety of *Primula formosa*, the mountain auricula, sent to Mr. Baines, from Hawkswell Moor, by Mr. Pulleine, and of which specimens were exhibited; also an elongated form of *Ileocharis acicularis*, from Hebden Bridge, and a variety of *Luyula piloso*, from Stockton Common. The paper was much applauded, and gave general satisfaction to those who were present to hear its contents read.

In the discussion which followed, Mr. Babington paid a high compliment to Mr. Baines for the enterprise in publishing, and talent in composing, his "Flora of Yorkshire," and urged the notice of the work on individuals interested in botany, as local Floras notoriously do not pay the expenses of their publication, unless extensively supported.

Mr. BABINGTON described three little interesting plants which he had discovered, and which he believed were entirely new to the British Flora. One of those plants he found overlooking a large limestone at Teasdale,

growing in a marshy place, and he thought it was entirely a new genus. The other two which he had found he also believed to be new. The second small plant was a thistle found somewhere upon the shores of Forth, and was very popular in Odessa. He thought, perhaps, the reason the flower had been found on the shores alluded to, was in consequence of large packages of different sorts of seed being brought in ships across the Black Sea, from Odessa, and that some of the seed had fallen out upon the shore and there vegetated. The next plant alluded to by Mr. Babington was similar to common goose grass, and which he considered to be an extraordinary specimen. After Mr. Babington had given a brief description of the three plants, he said that he thought they were worthy the attention of botanists, and that was the only reason he had in bringing them forward before the meeting.

#### ESTIMATED VALUE OF FLORISTS' FLOWERS.

It has been the custom to judge of the comparative worth of florists' flowers by the number of times they have appeared in winning stands, and in the absence of better evidence, it is well enough, but it must be always estimated with conditions annexed. If there happen to be but three hundred plants of one kind sold, and thirteen hundred of another, and the flowers are equally good, we shall find the one of which most was sold in the most winning stands; and the public do not always know the relative number of each in cultivation. Again, one flower may be uncertain and good, and another constant but very middling. The uncertain good flower is sure to be beaten in the number of stands it appears in, supposing the number of both in cultivation be equal, and the next season a great many of those who had the uncertain flower, impatiently throw it aside, because it disappoints them. The next season there are twice as many of the bad one grown, while not half the number of the good one are grown, so that the good one for its treachery shows worse every year, and at length gets abandoned. The impatience which banishes the first-rate flower, from three-fourths of the collections, and induces the exhibitors to encourage the flowers that they can make sure of, tends greatly to deteriorate the quality of the flowers in general; and we may attribute to this impatience the toleration of many second and third-rate flowers, which spoil by comparison every stand that is set up, and the continuance of a second-rate breed. It is this impatience that has banished such flowers as the Glory of Plymouth, the Countess of Pembroke, the Egyptian King, and other stars; and whatever banishes a good flower

from collections lessens the chances of a good breed, while such a flower as Nicholas Nickleby, one of the most ugly and confused mops that ever damaged a dozen, was to be seen in every selection and every stand, simply because every flower was full and double. The prevailing fault of all judges—there are few if any exceptions—is a total disregard of that essential quality, symmetry; so long as a bloom does not show the eye, they seem to utterly lose sight of the confusion which prevails. So long as a flower is double enough, they make no distinction between a mop and a model; so that in fact it is possible that an ugly, and, in our estimation, a useless, indeed a mischievous variety—like Nicholas Nickleby, may be seen in every stand winning and losing, while infinitely better are left in the garden uncut, or in the box unused. The number of times a flower appears in winning stands simply then decides that it is either a constant variety, or that there are a great many in cultivation. The better way of determining the comparative value of a flower, is to obtain without any general communication, from good growers, and supposed good judges, lists of what they consider the best twelve, or the best twenty-four in cultivation. By estimating the number of lists in which a flower appears, some idea may be formed of the best; but this will not be a perfect guide, because but few will put into their list the uncertain good ones, so that even this list will be insufficient. There is but one sound method of testing flowers, and that is class-showing, where a bad variety cannot be carried through by a good one, and insensible as one-half the growers are to the value of symmetry, when they come to see single specimens side by side, and have to place the best first, the best speak very plainly for themselves, and by comparison beat the mops even in the eye of a common observer. There is no impressing some growers with the proper notion of a true model; unless they have it before them they can form no idea of it. They cannot carry it in their mind, and without this they never can be good judges. They know a flower is to be round, it is to be globular on the face, the petals symmetrically disposed, the eye compact and up even with the face, filling up the centre; they know that the back of the petals ought not to be seen, and that they should be thick and smooth, and free from notch; and yet with all this knowledge they go into a room, and adjudge flowers as if they knew nothing about them. This arises from being unable to carry in their mind's-eye the perfect form, and seeing at once the deficiency of those before them. It would be no bad project to procure models instead of drawings, of imaginary flowers (if

there be no real ones good enough), to be always placed in a show-room, that the judges may be able to see what a thing is by comparison with what it should be. This would be one of the best steps that could be taken, and we wish some central society, or any one that takes a lead in Floriculture, could superintend a construction of a series of models of florists' flowers in some imperishable material, and so constructed that any society might procure duplicates; all classes would soon become familiar with their true properties, and there would be much less difficulty even among persons of middling capacity in estimating the value of florists' flowers. At present, glaring faults are overlooked; even at the grand meeting in London, where no less than seven judges awarded titles of merit to seedlings, the very best flower in the room was overlooked altogether, and one was selected that will knock down two or three degrees every stand it is placed in; but we are quite certain that the judgment was as honest as honesty and a proper consideration of the duty could make it, and that it arose out of pure oversight of some of the attributes of a perfect dahlia, and a very common mistake as to the importance of cupped or reflexed petals. As to any supposed impropriety on the judgment of the stands, those who go in after the judges come out, should be careful how they condemn a decision; an hour alters the general complexion of a stand so much, that a place which seems altogether wrong, may have been perfectly right when it was judged, and an eye that is compact and good one half hour, may be not even showable the next. Upon the whole there is no way so good to obtain a list of the best flowers, as to procure one from a number of growers, and then sum up those which are in most lists, as the flowers for your cultivation. However, it is pretty well supplied by the publications of the day, and perhaps by nothing more perfectly than *The Gardener's Almanac*.

#### NOVEL MODE OF PLANTING THE VINE,

I respect Mr. Hoare as a cultivator of the Vine, but the following remarks in his recent work on what he calls "an improved manner," puzzles me a little, I believe novelty like charity covereth a multitude of sins, but this is regularly turning topsy-turvy. He says:—

"There remains now to be described a mode of cultivating the Vine, which, from its simplicity and economy, and its easy practical adoption, recommends itself most especially to the notice of a vast class of persons who are not in possession of the means to

practise any of the usual methods of culture. This mode of culture is based upon two important principles connected with the growth of the Vine. The *first* of which is, that a body of substances or materials, of the nature already described, being enclosed in hollow brickwork or masonry erected on the surface of the ground, will nourish and support the roots of a Vine inserted therein, as effectually as it would do, were the brickwork or masonry enclosing the materials, placed *below* the surface of the ground. The *second* principle is, that the roots of a Vine, when enclosed in this manner, and supplied with the requisite degree of moisture, will strike *upwards*, and grow as freely in that direction, as they will *downwards* or horizontally, when the brickwork and materials are *beneath* the surface of the earth.

"On these two important principles, an easy and novel mode of cultivating Vines may be practised, which may be described as that of building hollow brick erections on the surface of the ground, of any shape, circular, square, or otherwise, and filling them with dry materials of the description already mentioned, then planting in each erection, amongst these materials, the roots of a Vine, and training the branches of it on the outside surface of the brickwork.

"These are the principal features of this method, which, perhaps, will be more clearly understood from a detailed account of the mode of putting up an erection of this description, and planting a Vine inside of it.

"For this purpose, a hollow circular column, five feet high, and three feet in diameter, may be chosen. A *circular* erection is the best, because the sun will shine all round it throughout the growing season, and also because shoots of a Vine can be trained so much more easily round a circular column than round one of any other description having corners or angles to it.

"It must first be observed, that, as the soil or ground on which erections of this description can be put, will have no connexion whatever with the roots of the Vines that are to be enclosed within them, proper and convenient sites may be chosen wholly irrespective of the nature of the soil on which the erections are to be built. Any situation, therefore, will do, provided it be sheltered, and have an open exposure or aspect facing the course of the sun.

"Assuming, then, that a proper site has been chosen for the erection of a column of the above-mentioned description, the following directions in building it are to be observed:—

"1st. Lay a course of bricks on the ground

in the form of a square, the sides of which shall measure four feet. This is to form the base of the column, and is intended to give it an architectural feature. Now, if the site be near any building or wall, or straight path, then the sides of this base must be at right angles with that building, or wall, &c.; but, if none of these exist, then the base must be laid with its corners pointing to the four cardinal points of the horizon. The joints of the brickwork are to be filled in with cement or strong mortar, so as to prevent the roots of the Vine from penetrating through into the soil beneath.

"2d. The base of the column being laid, the circle for the brickwork of it must then be accurately marked out; after which, the first course of bricks is to be laid flatwise, so that their inner ends may point to the centre of the circle, and their outer ones form the periphery of it. Half bricks will be sufficiently strong, provided that at four equally distant parts of the circle, in every course, a whole brick be laid, which will strengthen the work and make it firm. Half bricks, while the cost of them is much less, will not require so much cutting as whole ones, and they will, also, leave a greater space inside of the columns for the reception of the materials. The first circular course being laid, the interior is to remain as it is, hollow.

"3d. Now mark the exact spot in this course where the shoots of the Vine is to go through the brickwork, and this should be opposite the centre of one of the sides of the base, that faces either the south, or east, or any intermediate point. This spot being marked, the second course of bricks is to be laid as before, observing, that, as the shoots of the Vine is to go through here, a semicircular hole is to be made in the upper surface of the brickwork, of an inch and half in diameter, to form a passage for the shoot. The second course being laid, a sufficient quantity of materials to fill the column, of the description already mentioned, having been previously provided and properly prepared, the hollow space is now to be filled with them as high as the surface of the brickwork. They must be put in by the hand, and placed closely and compactly together.

"4th. Now plant the Vine, observing the directions respecting the roots already given,\* which are to be strictly followed. The Vine should be a strong plant three years old. It is to be laid on its side, with its roots inside of the column, and its shoots passing through the semicircular hole to the outside of it. That part of the shoots that lies in the hole is

\* Between two pieces of flannel wet with soapuds.

to have all its buds cut out, leaving as much of the shoots outside the column as contains three good beds.

"5th. The Vine being thus planted, the third course of bricks may be laid, taking care that a brick with a semicircular hole, exactly the same size as the other, is laid over the brick on which the shoot of the Vine is resting, and which will then be lying in a circular hole, an inch and a half in diameter. The third course being laid, the internal vacancy must be again filled up with more materials, taking particular care to place them close round the inner end of the hole containing the shoot of the Vine, so as to prevent the entrance of mice, or any other unwelcome intruders. The hole on the outside, also, should be filled with moss, which will give it a more slightly appearance than if left open, and likewise protect the roots during their first growth.

"6th. The remaining courses of brickwork may now be laid in succession, and the materials filled in as the work proceeds. When the column is built up within three courses of its intended height, and the materials filled in exactly even with the brickwork, a course of whole bricks must be laid over the entire surface, taking care that those which rest on the materials are not to be laid on mortar, but merely jointed with it. This course being finished, the last two are to be formed with whole bricks laid flush with the outside, and with their inner ends slightly sloping towards the centre of the column, which will cause all the rain that falls on them to run towards it, and fall into the sunken hollow space that will be there formed by this circular ring of brickwork. The circular space, which will be about eighteen inches in diameter, and six inches deep, is intended as a receptacle for all the rain that falls on the surface of the top of the column, which will filter through the single thickness of the bricks, forming the bottom of the hollow space, and thence be distributed by the absorption throughout the whole mass of the enclosed materials, thereby supplying that moderate degree of moisture to the roots of the vine, which contributes so advantageously to its nourishment and support.

"The column will now be complete. The sunken space at the top of it may, if desired, be filled with mould; and mignonette, or any other annual flower of suitable growth, may be grown in it, and which, hanging pendently over the edge of the column, will present a very graceful appearance.

"The pruning and training of the shoots of the Vine will be the same as if planted against a straight wall. The circular surface

of a column of these dimensions will contain 45 superficial feet; a few years, therefore, after its erection, the Vine will annually yield 50 lb. weight of grapes. The whole cost of erecting one, including the enclosed materials, will be about 25s.

"Columns may be erected of a larger or smaller size than that here described; but if the diameter be much less than three feet, the shape must be that of a polygon of many sides, if built with bricks of the usual shape, on account of their ends being rectangular.

"A column may be erected on any spare or convenient spot, either contiguous to a dwelling, or in a garden, and by putting up a couple at opposite or corresponding points, or a greater number sufficient to form a harmonious combination, a highly ornamental appearance may thereby be created. The simple contrivance of chambering the roots inside, and the provision of the sunken water-table at the top of the column outside, prevent the necessity of the slightest trouble being required in the management of the Vine, beyond that of the ordinary routine of pruning and training, while, at the same time the Vine is placed in such superior conditions with reference to its roots, that fine well ripened grapes may always be depended upon.

"On the whole, therefore, it may be said that this entirely new method of growing grapes on the surface of hollow brick erections, which has now been brought under notice, and fully explained, presents so many advantageous features, and is withal of such easy practical application, that a vast number of persons, who have not hitherto possessed the means of cultivating even a single Vine, may now, at a trifling expense, enjoy the very great luxury of having, at every returning season, an ample supply of delicious and fine flavoured grapes.

#### CHEMISTRY APPLIED TO HORTICULTURE.

THERE is nothing more important than an acquaintance with just so much of chemistry as applies to whatever project we engage in, and perhaps scarcely any science has more to do with chemistry than horticulture, although few of the old gardeners trouble their heads about it. The moderns are making up for this by running into the other extreme, and founding every thing upon it, and from the numerous communications to garden newspapers, it is obvious that one half the writers exemplify in their own persons the very generally admitted fact, that—

"A little learning is a dangerous thing."

Let chemistry and all belonging to it alone,

and keep on with the old jog trot routine of gardening, or learn enough to prevent your being misled by nostrum dealers and experimentalizers. Chemistry made easy, is the title of a small book which every body should read, because the earth is one immense laboratory, in which some chemical process is always going on while a plant is but a laboratory on a smaller scale, equally engaged in making chemical changes in what it takes from the atmosphere as well as the earth and appropriating certain portions to its own use, we are taught in the work we have mentioned that—

“Chemistry is the science, which enables us to investigate the mutual action of bodies, in each other; to unravel the web of nature, and thus discover, the elements, of which the things that are around us, are constituted. It performs its operations, by a play of combinations and decompositions; of likes and dislikes; through which it unites dissimilar substances, into new compounds, totally unlike, in appearance and qualities to the ingredients of which they were composed. This it does, not in masses, or at random; but in definite proportions; and by indivisible quantities, situated at an inconceivably small distance from each other.

“It informs us of particular bodies, which the skill of man, has, as yet, been unable to decompose, styled Elements: of Gases, Acids, Salts, Alkalies, Earths, and Oxides, by the combination of which, under certain modified forms and qualities, the whole material part of the universe, is constructed, renovated, and kept in being. Such of these as shall have connexion with the purpose in view, I shall now bring, briefly, under your notice and consideration; premising the subject, with the observation, that in all chemical action, *heat* is disengaged; as is most powerfully manifested to the senses, during the decomposition of a heap of stable-manure; and is present in every material, either in a hidden, or perceptible form. It is the cause of fluidity, and known to men of science, by the name of Caloric; and when abstracted from water, the latter becomes a solid mass, (Ice).

“Two modes are used, in investigating the nature of objects, desired to be ascertained, viz. by effecting the union of two or more substances, into one compound; called Synthesis; and by disuniting the ingredients, of which a substance is compounded, and exhibiting them, in a separate state; termed analysis.

“Elementary bodies are, the metals, oxygen, hydrogen, nitrogen, carbon, silicon, sulphur, phosphorus, chlorine, &c.

“The metals of which there are in number, forty-two, are obtained, in different stages of purity, from the various strata of the earth, or in combination with acids, and other substances. When extracted from their ores, they possess in general, lustre, opacity, and fusibility; and many of them malleability, and the capability of being drawn into wire.

“Oxygen exists pure only, as a gas; which is a substance, in a permanently-aeriform condition. It is one of the constituents of atmospheric air, by which, the respiration of men and animals is supported. It enters largely into union with metals, &c.; and is the principal cause of sourness, rustiness, and rotteness.

“Hydrogen, is also a gaseous body; and in combination with oxygen, (water,) is one of the most universally-diffused elements, in creation. It is eminently combustible, and the lightest of all known substances.

“Nitrogen is of a similar nature, to the two foregoing, existing separately only, as an elastic, invisible gas; and enters largely, as a diluent, into the composition of the atmospheric air. It is characterized, by its inaptitude to combine with other elements. It exists in vegetables, and constitutes a principal portion of the flesh of animals. It abounds in ripe grasses, especially in their seeds; also in peas, beans, and vetches.

“Carbon is the basis of coal, oils, and fat; and constitutes, nearly the whole of the solid parts of trees and vegetables,

“Silicon, is derived from flint and sand.

“Sulphur is a yellow inflammable substance, obtained generally, from the neighbourhood of volcanoes.

“Phosphorus is an inflammable substance, derived from bones, and is to be found in most vegetables.

“Chlorine exists, as a green-coloured gas.

“Acids are substances, which, when applied to the tongue, usually produce the sensation, termed sourness; and very commonly contain oxygen. The compounds they form, in union with other bodies, are known by the name of salts.

“The acids, which more especially concerns the agriculturist, is carbonic acid, which exists, naturally, in a gaseous form; and is constituted of two parts of oxygen, and one of carbon. It is produced, during the respiration of men and animals; and in the common process of burning wood and coals; and from these sources, is present, in a small quantity, in the atmosphere: and acts a most important part, in the support of plants; which convert its carbon, into their substance, and give back its oxygen to the air.

“The formation of an acid, may be fami-

liarily shown, by moistening the interior of a tumbler-glass, with a small portion of water, by means of a sponge; and (having inverted it,) burning under it a sulphur match; when the sulphur combining with the oxygen of the air, will impart a sour taste, to the liquid, adhering to the sides of the glasses, viz. sulphuric acid.

"An alkali is a caustic acrid body, possessing the property of converting the blue juices of many vegetables into green: and the term is more especially used, to designate the well-known substances, potass, soda, and ammonia. The first of which is derived, abundantly, from the ashes of plants; the second from common salt; and the third is formed during the decomposition of animal and vegetable-matter: and its presence is absolutely necessary, to the support and growth of plants, and consists of one atom of nitrogen, and three atoms of hydrogen.

"The compounds which alkalies form with acids, are also called salts; the same appellation being given to unions of acids, with the two classes of bodies, of which we shall speedily treat; namely, earth and oxides.

"The formation of a salt, will be shown, in the following experiment.

"If a few grains of common soda, be gradually dropped into a wine-glass, containing muriatic acid, (called hydrochloric acid,) diluted with water, as long as bubbles shall be observed to arise to the surface, and then discontinued, the liquid will be discovered to have lost its sourness, and the taste of the soda will also have disappeared; whence the compound formed, (common salt) is called a neutral salt; and it is, as such, that most salts are found existing in soils. The scientific name of common salt, is chloride of sodium.

"Salts, therefore, are compounds of an acid with an earth, alkali, or metallic oxide; and in crystallizing, each assumes its own determinate and peculiar shape. Thus nitrate of potass, (nitre,) forms prismatic octahedrons; sulphate of potass, (glauber's salt,) six-sided prisms; chloride of sodium, (common salt,) cubes.

"Earths are insoluble compounds, commonly present in soils; as alumina, the basis of clay; silica, the basis of sand; and lime, a principal constituent in chalky soils, and in marl.

"Oxides are, generally speaking, unions of metals and other bodies, with oxygen; and among them, are comprehended the earths; and the alkalies, potass and soda.

"The following important chemical compounds, albumen, fibrine, casein, farina, (or starch,) and gluten, are products formed during the growth of plants. The three first

contribute directly to the support of animal life, after being taken into the stomach and circulation; and are identical in their constituents with flesh, and with the chief constituents of blood. The fourth is contained in milk, exists in beans and peas, and is the principle of cheese.

"Albumen and fibrine, together with farina, constitute the flour of wheat. The two former hold nitrogen, in their formation: the latter is without it: and contains the same elements, as sugar and gum; viz. carbon, oxygen, and hydrogen.

"Vegetable gluten, as obtained from wheat flour, consists of vegetable fibrine, with a small quantity of a foreign substance, which gives to it, its adhesive glutinous property.

ILLUSTRATIONS. — "If, into a glassful of ale, which has become tart, a few grains of carbonate of soda are thrown, the liquor will be rendered mild, and brisk. The acid, which occasioned the sour taste, (acetic), having a stronger affinity for soda, than carbonic acid has, herein combines with the soda, and liberates the other, in the form of carbonic acid gas; and it is to the presence of this gas, that cider, perry, and sparkling wines, owe their effervescing qualities.

"In washing the hands, in ordinary spring water, known as *hard*; the soap used in the operation, will frequently have been found to have been almost useless; and the liquid to have assumed a curdled appearance. This is occasioned, from the decomposition of the soap, (which is formed of an alkali and tallow,) by the acid, of the sulphate or carbonate of lime, in solution, which caused the hardness: the acid uniting with the alkali of the soap, and releasing the tallow; which showed itself, as before stated, upon the surface of the water.

"If, into a dry tumbler-glass, a few grains of oxalic acid are placed, and water, from a similar source, poured upon it; the water will become turbid, owing to the combination of the acid with the lime; forming an insoluble compound, (oxalate of lime.)

"Certain springs, (as at Matlock, in Derbyshire,) called petrefying waters, contain carbonate of lime in large quantities; which is partially decomposed, on coming in contact with the atmosphere; and substance placed therein, are, in a few weeks, coated with that substance.

"A cause of softness, in rain-water, is due, first to its not containing such salts; and consequently not curdling soap: and also to its holding in solution, a small portion of carbonate of ammonia. It is these earthy carbonates in solution which cause what is termed "*furr*," in tea-kettles, and other culi-

nary utensils; the acid with which they are combined, being driven off, by the heat of the fire; the lime is deposited on the sides and bottoms of the vessels.

"In cutting an apple with a polished steel knife, the part of the blade which has come into contact with the fruit will have been observed to have become black, as if stained with ink. This stain is occasioned by the acid of the apple (Malic), combining with the iron, and freeing from it the carbon with which it was united, in the formation of the material—steel.

"Should a ploughshare, or any other iron instrument, be suffered to remain a few nights exposed to the action of the moist atmosphere, it will acquire a coating of a brown colour, termed rust. This is caused by the oxygen of the air uniting with the iron, and forming an oxide. It is owing to iron, in this condition of oxidation, that a brown or yellow colour is communicated to clay, sand, &c.

"Dissolve any given quantity of marl in diluted muriatic acid; pour off the fluid from the undissolved matter, and to it add a small portion of common potass, dissolved in water; lime, which makes it valuable, will be separated, and the proportion present can thus be ascertained.

"In stables, wherein a powerful smell of hartshorn (ammonia), is perceptible, if an ounce of muriatic acid (on a plate) be placed therein, dense white fumes will be seen in its neighbourhood, which are devoid of all smell. This is muriate of ammonia. The acid having a strong affinity for this alkali, has attracted and retained it. And I here venture to suggest, that if in stables, the floors were occasionally sprinkled with water containing muriatic acid, in the proportion of two ounces of the latter to a gallon of the former, the smell would be considerably destroyed, and the injurious influence of the ammonia upon the horses be greatly weakened.

"If an ounce of oil of vitriol be poured into three separate wine-glasses, and in the first there is inserted a piece of straw, in the second is placed a small portion of cork, and into the third is dropped a lump of loaf-sugar; the three substances will become black, the straw appearing as if it had been charred by a fire.

"The oil of vitriol (sulp. acid) has, in these three instances, united with the constituents of these several substances, except their carbon, which imparts their well-known black colour of charcoal to the parts remaining. In the instance of the sugar, which is composed of carbon and of water, it has merely abstracted the elements of the water (hydrogen and oxygen), and left the carbon untouched.

"The production of water may be observed, during the burning of a gas-lamp, in a coffee-room, &c., where a funnel-shaped chimney is frequently to be seen suspended over the flame, attached to a tube, having a glass globe at its extremity, generally containing a fluid, generated during the combustion of the hydrogen gas, in union with the oxygen of the atmospheric air, which is water.

"The chief constituents of corn—fibrine and farina—may be obtained in the following manner:—

"Enclose a portion of the flour of wheat, made into a paste with cold water, in a small muslin bag, which squeeze in a gentle manner in a basin of cold water, so long as any white particles are discharged from the bag. The residue in the bag is fibrine; the powder at the bottom of the basin is starch or farina.

"By rubbing an unripe apple upon a grater, and washing the portion which is rasped off in cold water, starch will also be collected: which starch, had the apple been suffered to remain until ripe, would have been converted into sugar, forming the sweet juice of the fruit."

#### DESCRIPTIVE NOTES ON A FEW SELECT CARNATIONS AND PICCOTEES.

An article under this title appears in the *Florist's Journal*, which it would be unfair to reprint, but the portion which relates to the Scarlet Bizarres will give a very good idea of the value of the whole:—

"SCARLET BIZARRES.—The *furor* that was excited by *Twichell's Don John* a couple of years ago, has subsided, and notwithstanding that the raiser has obtained all the prizes in its class within this year at Cambridge, I consider it a very uncertain flower, having seen many blooms of it this year, and hardly one perfect one. Shading does not suit it, for then the petals do not expand sufficiently; and if in the sun, its very brilliant colour is apt to run. It is, however, a variety worth possessing, and may perhaps get more steady as it grows older.

*Martin's Splendid*, in colour a rich brownish scarlet, deserves the name; but its growth is very bad, not rising more than 18 inches in the flower stem, and the foliage scanty and dwarf. Hence perhaps it maintains its high price longer than other varieties.

*Ely's Lord Pollington*.—Pod good, colour good also, and, like all of Ely's flowers, opens well and flat.

*Smith's Duke of Wellington*.—A large bright coloured flower, pod good, luxuriant in its growth, and a very desirable variety.

To these may be added Ramsforth's Game Boy, and Fletcher's Duke of Devonshire."

Now we take this to be a very meagre and unsatisfactory guide for a young beginner, and old growers could supply much 'better for themselves. The *Garden Almanac* of last year gives thirteen names of Scarlet Bizarres, every one of which is a show flower, and the worst of which Hufton's Patriarch. This gives us "descriptive notes," as they are called, of four only, and mentions two which "may be added." Twitchett's Don John has only half a character, Martin's Splendid hardly that; Lord Pollington and the Duke of Wellington pretty good characters; Ramsforth's Game Boy, and Fletcher's Duke of Devonshire may be added. Now the value of this as a guide is just less than nothing — two flowers that the writer evidently don't know how to grow, are all but condemned; two that will grow, whether used well or not, are passed; and two are apparently neither one thing nor the other, may be grown, if we like to grow them. Headley's Achilles, Strong's Duke of York, Calcut's Brutus, Thorpe's Defiance, Elliot's Duke of Sutherland, Lodge's True Britain, Bucknell's Earl Fitzharding, and Appleby's Prince of Wales, are not worth the writer's notice. Truly amateurs who want information, and dealers who wish for customers, must be much obliged to this volunteer note maker. For better would it be if people who knew but little would write but little — for this gentleman's "descriptive notes" on a few select Carnations, are a good deal worse than useless — they will mislead, if any one attends to them, for they imply that the select six are selected because they are good; and then, by condemning two of them, and refusing any character at all to two others, they leave the reader to conclude that the two which have good characters, are the only two good Scarlet Bizarres. We have not gone a step further, for by what is said of the highest class of Carnations and their habits we judge the whole article.

#### GUANO.

##### DIRECTIONS FOR USE.—HINTS TO COTTAGERS.

IN the application of this valuable manure, it is necessary to keep in view its powerful properties, and to exercise great care to prevent its coming into immediate contact with the newly sown seed or the foliage of plants and flowers. It should never be placed in contact with seeds; for all seeds in the process of germination give off a greater or less quantity of carbonic acid and vinegar; and these acids, having strong affinities for the ammoniacal portion of the GUANO, are apt to attract it so powerfully, as to check and even destroy ve-

getation. **PREPARATION.**—*To secure its safe application*, it has been found most effectual to mix it with about four times its own bulk of finely sifted mould, ashes or charcoal, or even with sand, if the soil be of a cold clayey nature; and that the mixture may be complete, the Guano should, *before mixing*, be carefully passed through a fine garden sieve. That portion of the Guano, such as the undecomposed bones, beaks, or claws of birds, which cannot be passed through the sieve will nevertheless be found strongly impregnated with ammoniacal salts, and by steeping in water, will readily yield a rich liquid manure. An intelligent farmer in Dumfriesshire, in reference to the necessity of mixing the Guano before applying it to the soil, says, the objects of mixing Guano are, 1. To partly disinfect it by absorbing its volatile products and diminishing its smell. 2. To separate its active particles, and thereby diminish their action on each other. 3. To present it to warm soils in a form in which its action will be less violent at first, but more protracted and steady than when given in an unmixed state. Of course, the colder the soil, and the earlier the season when sown, the less quantity of mixture is needed, and conversely. But as a general rule, it should be mixed as equally as possible, with four times its bulk of finely sifted, moderately dry, black or brown coloured earth, or peaty matter, sawdust, slightly burnt clay, charred turf, coal or peat ashes, whichever of these substances can be most conveniently had. Perhaps newly burnt charcoal used as soon as cold, is the best matter that can be had for mixing; but as it can seldom be at the farmer's command, any of the above matters will answer in its stead. Where a considerable quantity of useless wood can be had, it might be piled up, surrounded, and nearly covered with clayey or spratty turf, and burnt with little admission of air. When cold, the charcoal, clay, and charred turfy matter, if well broken with a spade, mixed, and put through a sieve, will make an excellent mixture for Guano, especially for light warm soils. Some have mixed Guano with sand, and when for a cold clayey soil, this mixture seems very suitable; only sand need not be given in more than double its bulk, and should be put in the soil soon after mixing, whereas any of the other mixtures may, with advantage, stand, beat up, under cover for a week or more, according to the weather, character of the soil, and distance at which it is to be put below the seed, and also in proportion to the quantity of Guano given to the acre. The colder and heavier the soil, and the colder the weather, the more slightly the manure ought to be covered, and conversely. No rules can super-



seeds experience in this. When either dung or bones are given as part of the manure, and when the soil is moderately moist, or disposed to clay or peat, the *Guano* should be put near the seed. Again, where the ground has just been limed, the *Guano* ought both to be given in a large quantity of mixture, and covered rather deeper than in ground not limed for a year or more. On light soils, lime should, if possible, be mixed some weeks before *Guano* is given.

It would appear, that grass-crops, of all others, most appreciate the *Guano* manure, and shew the most wholesome and productive results, under applications varying from 3 cwt. to 20 cwt. per imperial acre; and considering that by far the larger portion of the soil of Great Britain consists of pasture and meadowland, it is of paramount importance that the grazier should be enabled to set a proper value on this unexceptionable manure. The increase of weight and bulk thus obtained does not arise from the greater abundance of coarse rank grass, as some persons have insinuated, but from the general luxuriance of the crop, and particularly from the increased thickness of the growth of the short and finer grass; this latter effect will be very observable after cutting.

As some anxiety at one time existed as to the quality of hay or grass raised by *Guano*, it is proper to state, that the hay has proved of the finest quality; and moreover, that on pas-

ture land, where an experiment field was partly manured with *Guano* and partly left in its original state, the cattle were observed to give a decided preference to the *Guanoed* portion of the field. Where a liberal application of *Guano* is intended, it is particularly recommended to divide the manure into at least two successive sowings, as the full quantity, given at one application, might injure the more tender grass. The following extract from the *Mark Lane Express*, exhibits the productive effects of 3 cwt. of *Guano* per acre, and at the same time, notices the peculiar value of this manure to the cottager, by increasing his limited resources, a suggestion which, it is hoped, will be appreciated by those who take a benevolent interest in that humble class. "On an eight-acres field, sown with 3 cwt. of *Guano*, and 3 bushels of Italian rye-grass per acre, on the 29th of April, cut on the third of August, the produce weighed, when cut, 18 tons, and when dry and ready for stack, 4 tons per acre. Much of this crop was upwards of five feet long; so rapid was the growth, that fifty hours after cutting, it had again sprung up to the height of 3½ inches. With such grass, and such manure so easily convertible into liquid, I see no reason to doubt that the cottager, with his five roods of land, could supply his house with vegetable, and cow with winter and summer food, thereby providing for his family an almost entire subsistence.



THE GUM CYSTUS.

THIS is a very beautiful but straggling shrub whose flowers open in the morning and close at night. It is one of a genus which presents us with a great variety, from dwarf shrubby rock plants with small flowers to the present subject which is wide spreading and lankey. The Gum Cystus will trail along the

ground, for it has not strength to support itself when the branch grows its full length; the flowers are flimsy, and generally fall the same day that they open. The purity of the white and the contrast formed by the dark centre or eye, render it a desirable ornament but it must either be placed where it may lay and

spread on the ground without hindrance, or be supported by stakes. The bloom is a good deal like that of some hibiscus, but the habit of the plant if left to itself is loose and straggling.

#### CAMELIAS APPRECIATED AND DESCRIBED IN AMERICA.

*Camellia japonica* var. *Coquétii*. Abbe Berlèse *Monographie*. This variety is of recent introduction to our collections. Flower, large, regular, and symmetrical—the exterior petals deep crimson, those approaching the centre, rose colour shaded with violet, handsomely imbricated and diminishing very gradually in size from the circumference inward. Sometimes striped and splashed with white. Desirable.

*Camellia* j. var. *Duchesse d'Orleans*. Abbe Berlèse *Monog.* Flower  $3\frac{1}{2}$  to 4 inches in diameter, of the most perfect formation; petals beautifully cupped and imbricated, and standing erect in concentric circles to the very centre; colour, pale blush, nearly white, and exquisitely spotted and striped with rose. First class.

*Camellia* j. var. *Bruceana*. European *Catalogues*. The colour of the flower is deep orange red, a shade lighter than *C. var. Leeana* *superba* which it much resembles; the form nearly regular; petals imbricated and well arranged. Size, large.

*Camellia* j. var. *eclipsis rubra*. European *Cat. Preston Eclipse*. Abbe Berlèse *Iconographie*. Colour, light rose, veined distinctly with darker shade. Form and size of *C. var. Press's Eclipse*, from a sporting branch of which it no doubt originated, and has by grafting been perpetuated as a distinct sort.

*Camellia* j. var. *Oxriglomana superba*. Abbe Berlèse *Icon.* Flower  $3\frac{1}{2}$  to 4 inches in diameter. The large outer petals are broad and round; those of the interior narrow, elongate, and erect. Form of *C. punctata*, ground colour rosy blush, distinctly marked with spots and lines of carmine red.

*Camellia* j. var. *serratifolia*. European *Cat.* This is a variegated variety; the beauty of which is wholly dependent on the quantity of white with which it is marked. It is usually much spotted, on a deep rose ground, and in this condition a pretty, desirable sort. Size, rather less than medium, having 3 or 4 rows of petals, regularly arranged, with some stamens intermixed. Flower resembles *C. j. var. Donckelaerii*.

*Camellia* j. var. *Vitória álba*. Abbe Berlèse. Flower  $3\frac{1}{2}$  to 4 inches in diameter; white, slightly spotted with rose, and occasionally a petal suffused with deep blush or

pink. Form of *C. var. imbricata alba*, full, round, and double. Received from the Abbe Berlèse and undescribed.

*Camellia* j. var. *Saccoi* (colour di lacca). Abbe Berlèse *Monog.* The colour of this flower is a pale rose nearly pink. Petals regularly imbricated, faintly striped through the centre, and touched at the apex with white. Form, good; size, medium—does not open its flowers freely.

*Camellia* j. var. *Saccoi nova*. German and French *Catalogues*. A new desirable *Camellia*, perfectly regular and symmetrical in its form. Petals beautifully cupped and imbricated; colour, very light delicate rose; size,  $3\frac{1}{2}$  to 4 inches. First class.

*Camellia* j. var. *Saccoi des Peintrés*. Abbe Berlèse. Flower medium size; petals regularly laid over each other in shell form, entire, round; colour deep rose, distinctly spotted with pure white. Handsome. Received from the Abbe Berlèse. This and the two preceding varieties were raised from seed by the late Dr. Sacco, of Milan.

*Camellia* j. var. *Carswelliana*. Abbe Berlèse *Monog.* The form of this *Camellia* is like the old double white, regularly imbricated to the centre. Colour a deep cherry, red, the petals being frequently striped through the centre and marked at the apex with dingy white. Very shy in producing its flower buds.

*Camellia* j. var. *Mile E'ndi*. English and German *Catalogues*. Flowers of the loose waratah formation, with two rows of outer guard petals, those of the centre being long, narrow, and erect; size 4 inches, clear rose colour. Raised by Mr. Thompson, of Mile End, near London.

*Camellia* j. var. *pictorum coccinea*. Abbe Berlèse *Monog.* Form and colour of *C. var. florida*; petals broad, large, handsomely cupped, with sometimes a few of those at the centre not fully developed.

*Camellia* j. var. *Collettii*. German and French *Cat.* Flower of the irregular formation, 4 to  $4\frac{1}{2}$  inches in diameter, full and double; exterior petals broad, those of the interior narrow, numerous, forming a thick well filled centre. The colour is a deep crimson, approaching to scarlet, and the merit of this variety consists mostly in the manner with which it is spotted with white, being sometimes in this condition very beautiful.

*Camellia* j. var. *álba venusta*. French and German *Catalogues*. Flower of the irregular formation, round, double and full; white, sometimes slightly spotted and tinged with rose; medium size.

*Camellia* j. var. *foliolosa*. Herbert's *Amaryllidaceae*. *C. j. var. Amalthaea*. Ger. *Cat.* An English variety, produced from seed by

Rev. Mr. Herbert, Spofforth, England. Colour of *C. j. v. coucinnea*; 4 to 5 inches diameter; petals very numerous and well arranged, those at the centre narrow, long and irregular; devoid of stamens.

*Camellia j. var. Emelie grandiflora*. Abbe Berlèse *Monog.* Flower 4 to 4½ inches in diameter, full and spherical, with high centre; colour a shade lighter than *C. j. var. conspicua*, sometimes freely marked with white; a bold showy sort.

*Camellia j. var. innocenza*. French *Cat.* A pure white *Camellia* of large size and nearly regular formation. This variety has not always opened its flowers freely.

*Camellia j. var. madiolanensis*. Abbe Berlèse. A flower of very perfect form, and beautifully cupped, which shape it retains until near falling; colour, very delicate rose, or pink, almost blush; size medium. This variety I received from the Abbe Berlèse, and is yet undescribed by him.

*Camellia j. var. Bonárdii striata* Ridolphi. Abbe Berlèse *Icon.* A new *Camellia* of medium size, white, distinctly striped and spotted with rose; resembling *C. j. var. Press's Eclipse* in form and appearance, but is more strongly variegated, and of quite different foliage.

*Camellia j. var. Marchioness of Exeter*. English and German *Cat.* Clear brilliant rose; very large, 5 to 5½ inches in diameter; petals large and broad, not numerous, but imbricated and well arranged, exhibiting some stamens; a free, easy and bold flower.

*Camellia j. var. pictorum roseum*. European *Cat. Rosa pictorum*. Abbe Berlèse *Icon.* Flower large, 4 inches or more in diameter, and of a clear brilliant rose colour; form, regular; petals not very numerous, well arranged and gracefully imbricated, generally full, but sometimes a few imperfect stamens at the centre. Desirable variety.

*Camellia j. var. Henri Favre*. Abbe Berlèse *Icon.* A variety of superior excellence; flower 3½ to 4 inches in diameter; the outer rows of petals deep crimson, those of the interior gradually shaded to a delicate rose colour; exquisitely cupped and imbricated, and of the most elegant formation.

It is stated in the *Iconography* that Mons. Favre of Nantes produced this *Camellia* from seed, and sold it to M. Cachet of Angers for the enormous sum of 6000 franc. or more than eleven hundred dollars.

To have gained from seed a *Camellia* of the regular formation, and as perfectly imbricated as the old double white, would, a few years since, have been considered a matter of surprise. It is now, however, quite a frequent occurrence, and proves the success that has

attended its hybridization in this country. I venture to predict that we shall hereafter be exporters, as well as importers, of new varieties, and thus, in some measure relieve ourselves of the disappointments we have experienced by receiving those, some of which have had, at least, little else than a high sounding name, and glowing description, to recommend them.

Of less than twenty seedlings which have bloomed in my collection the present year, five have been of the regular perfect formation, and which it is believed will prove worthy of dedication, and a place in this magnificent tribe of plants.

In the collection of Mr. Boll of New York, (formerly Mr. Smith's of Philadelphia), a still larger number have flowered this season, and which he considers first-rate.

Among the successful cultivators who have produced fine varieties may be mentioned Mr. Floy of New York, Mr. Feast, of Baltimore, Messrs. Buist, Ritchie & Dick, Sherwood and others of Philadelphia. And of those already before the public, or soon to appear, may be named — *C. j. var. Landréthii*, *americana*, *amabile*, *Prättii*, *Martha*, *Hempsteadii*, *Sherwoodii*, *Feastii*, *Binneyii*, *Gen. Washington*, *Gen. Lafayette*, *Caroline Smith*, *Brooklynia*, *Wilderi*, and others, all of the full, regular, imbricated form.—M. P. WILDER, to Hovey and Son, Boston.

#### MR. PAXTON'S METHOD OF TREATING LUCULIA GRATISSIMA.

"NATURALLY," says the author, "the species is of luxuriant growth, making a few shoots, which grow to a great length, and, consequently, it is not by any means a bushy plant. After it has flowered, or indeed, before the flowers are well fallen, these branches produce several shoots near the apex, all the lower buds remaining dormant; and hence the plant is left bare of leaves and shoots, for, perhaps, more than half its height. And, if this is continued for two or three years, the growing powers of the plant are impaired, owing to the large quantity of useless old wood that consumes the sap necessary to support new growths. From this many cultivators have concluded that, to have good specimens, a fresh stock of young plants is necessary every year, and on that supposition have discarded the old one." And with great deference to Mr. Paxton, many cultivators are right, for the heads of bloom on well grown young plants would make three or four of the heads on Mr. Paxton's large plants, he says—  
"Now, although it is undoubtedly highly

desirable to have a number of young plants to flower as dwarf specimens, it is quite as much, if not more desirable, to have large bushy specimens furnished with branches to the surface of the pots; and this can only be done by preserving the old plants.

"The great error in their management is the fear of using the knife freely. It is only by pruning, and severe pruning, that the naturally straggling character of the old plants can be overcome, and reduced to the desired bushiness. Instead of allowing the uppermost buds on the preceding summer's growth to furnish the shoots for the succeeding season, the old branches should be cut away to within an inch or two of their base. Thus, two or three, or perhaps four branches, will be obtained from each near the point from which only one or two sprang the preceding year; consequently, the number of shoots will be yearly increasing, and instead of becoming naked at the base, and of a scattered growth, the bushiness will be continually augmented." This is true enough, and more yet may be said, for if there be not one half the new branches cut clean away, and the remainder well regulated, they will hardly bloom at all. It is very like the hydrangea. No body ever yet saw a head of bloom upon a large bushy plant, equal to the noble head that can be grown on a single stem from a cutting, Mr. Paxton admits, however, in his paper, that this character, may be carried to excess, even with the *Luculia*; for, he says, "if too many shoots are permitted to form, they will prevent one another from acquiring that degree of vigour which is necessary to produce a good head of bloom. Besides, the large size of the foliage demands a proportionate space for their exposure to light, and, if they are crowded, the loss of the interior and lower ones will be the inevitable result.

"Another error," he observes, "which necessarily ensues from permitting the uppermost buds to remain, is, that as they have mostly begun to grow before the flowers are withered, the plants are deprived of their season of repose, and kept in a continual state of excitement. But when pruned back to the lower buds, they may be placed in a cool place, and left without any water till the beginning or middle of February.

"Sometimes before they are again excited, a quantity of the earth should be shaken out from the roots, and fresh compost supplied. A rich loam, full of decaying vegetable fibre, and a third part of leaf-mould, makes an excellent mixture for them. When good peat can be easily procured, a portion may be added, but it is by no means indispensable. He says, "A great mistake is committed by putting

in heat immediately after they are potted."— This is so absurd a mistake that one hardly expects it to be done with any plant, we have known a house full of roses spoiled in the Royal Gardens, by taking them from the open ground to a heated house, but except in the Royal Gardens we never heard of any thing so ridiculous. Sudden changes are injurious to every thing (more or less) in the whole animal and vegetable kingdoms. "It is quite necessary to leave them a week or two in a cool place, that the buds may acquire additional vigour, and the plant be storing up sap to feed them when they are once more wanted to grow. Moreover, some of the roots will certainly be damaged in clearing them of the old earth and repotting, and if the plants are removed too suddenly to a high temperature, the buds will begin growing before the roots are in a condition to convey a sufficiency of nourishment to support them.

"A pit, where a temperature of from 60° to 70° can be maintained—according to the external weather and the advancement of the season, together with a proportionate humidity, is far preferable to a house during the first stages of growth. A rather liberal supply of water will be needful, and a gentle circulation of air. As the season advances towards midsummer, more and more air must be given, and the sun must never be allowed to shine fully upon them, as it is injurious to the young and tender foliage. After the middle of July a pit is no longer necessary, and the plants will be benefitted by being removed to the shade of a north wall, where they can also be sheltered from strong winds. Here they may be permitted to remain till the beginning of September, by which time every branch will be crowned with a tuft of flower-buds, and they will need no other heat to develop them than what is afforded by a close pit. Indeed, it is a very pernicious practice to give them much heat, for the flowers will be larger, and stronger, and better coloured, as well as able to last for a longer period, if slowly and steadily brought on till they expand; and, moreover, the leaves will have time to gain a fuller green." The answer to this is, that Mr. Bell of Norwich, grows the *Luculia Gratiissima* like a weed, never having them in a better place than a vinery which is not forced. In such a place we have seen splendid plants in fine flower, rich green foliage, and shrubby habit, with four or five heads on a plant, and these were the style of plants he was sending out at 7s. 6d. per plant, apparently a year old.

"The main reason," says Mr. Paxton, "for giving them a situation, when they are removed from the pit, where they may be continually shaded from the sun, is because a full

exposure robs the leaves of their bright green colour. They will, nevertheless, in spite of this precaution, though to a less extent, assume a reddish tinge, but after they are returned to the pit, they will recover their green hue before the flowers open." And well they may assume a red tint, they are it is true shaded from the sun, but the wind is very injurious to the foliage, the fact is that the sun if they are plunged will do them less harm than the wind, and it is much more important to keep off the one than the other.

"Like the *Hydrangea*," says the author, "it will become an ugly object when allowed to grow more than two feet high, if it be not frequently pruned. But, when pruning is regularly practised, it can be made to reach the height of five or six feet, and yet retain an ornamental character. Indeed, a good specimen of this height is a most magnificent thing while the flowers are open."

This is all very well, but neither pruning nor culture can make the heads of bloom of either plant equally fine in a large as in a small specimen, or even nearly so large. The plant as it increases in size must be thinned as well as sheltered, or the bloom will be hardly fit to look at under the highest culture.

#### NAPOLEONA IMPERIALIS.

AMONG the most remarkable plants that have hitherto been discovered ranks this rare species, of which living plants have been lately brought from Sierra Leone by Mr. Whitfield. That indefatigable collector having given me a dried specimen with a seed, and the Earl of Derby having most kindly placed in my hands a bottle containing the flowers in different states, an opportunity has arisen for clearing up the history of one of the most obscure genera in the records of systematical botany.

*Napoleona* was so named by the late M. Palisot de Beauvois, who first found it in the kingdom of Owari, in Western Africa, where it was common, especially in the woods behind the King of Owari's residence. From fragments preserved by that naturalist a good figure, so far as general appearance goes, was published; but with extremely inaccurate and incomplete details. The flowers were represented as being sky blue, with a sort of five-rayed star of a pink colour in the middle, and upon the whole the account which he gave of it was so unsatisfactory, that the very existence of the plant has been doubted by some people. In what De Beauvois was right and in what wrong, the following description will show.

It forms a bush about as large as a camellia,

according to Mr. Whitfield. The wood is soft, whitish, with large medullary rays, an abundance of dotted vessels, intermingled with brittle acicular tubes of woody tissue, very like what is found in the germinating radicle of a mangrove. No hairs are to be found on any part of the plant.

The leaves are alternate, leathery, between three and six inches long, obovate-lanceolate, tapering to an obtuse point, and narrowed at the base into a thick channelled petiole about a quarter of an inch long; there is no trace of stipules.

The flowers grow in threes, sessile in the axil of the leaves, and are surrounded at their base by several round imbricated scales, as in camellias; when expanded they measure two inches in diameter; Mr. Whitfield states that when decaying they assume a bluish tint, which has probably led to De Beauvois' error in representing them as almost wholly blue in their perfect state.

The calyx is a thick leathery cap, divided into five ovate segments, having a perfectly valvate aestivation.

Within this is placed the corolla, which consists of three distinct rings, each of which is monopetalous. The first ring is apricot colour, divided into five lobes, each of which has seven stiff ribs, between which the texture is membranous; the lobes have seven broad teeth, corresponding with the points of the ribs, and much curled and crumpled; by means of the ribs and intervening membrane, this part of the corolla is strongly plaited both before and after expansion; when fully blown it turns quite back over the calyx, so as to hide it completely. The second ring is very small and thin; it is in fact a narrow membrane, stationed at the foot of the first ring, and cut into an indefinite number of fine narrow sharp-pointed segments; this ring was overlooked by De Beauvois. The third ring is rich crimson, according to Mr. Whitfield, membranous, but erect, and assuming the form of a cup, whose edge is cut into many fine segments, turned downwards, so as not to be at all conspicuous. De Beauvois makes this a flat star of many points, which is altogether an error.

The stamens are in number twenty, standing erect in the form of another cup, of a rich apricot colour, and unequally united at their base; they have linear-lanceolate filaments, which are much thinner next the anthers, and are there turned inwards; the anther itself is oblong, two-celled, and erect; it is difficult to conceive how De Beauvois could have made out of this five petal-like filaments, each of which bears two anthers.

Next the stamens comes a deep fleshy cup

or disk, standing as high as the stigma, and having ten sides, of which the narrowest are alternate with the lobes of the stigma, and two-ribbed in the inside.

The ovary is buried beneath the mass formed by the base of the corolla, stamens and disk, so that unless you cut into the very base of the ovary the cells may be overlooked; it has five cells, in each of which two ovules hang from the top of an axile placenta, which is so attached to the partitions that there is a clear opening from the hollow centre of the style, over the ovules, into the cells of the ovary; the ovules are oblong, with a depression in the middle on each side, and a foramen next the base, the nucleus being curved like a horse-shoe, so that its base and apex are both nearly in contact; the style is five-angled, or rather five-winged, and terminated by a table-shaped stigma, with five sides, five rays, and a small elevation at each angle, which elevations are perhaps the true stigmatic surfaces.

"The fruit, according to De Beauvois, is a soft spherical berry, surmounted by the calyx, one-celled, many-seeded, the seeds lying in a fleshy matter; this is evidently incorrect.—Mr. Whitfield found it to be as large as a pomegranate, and very like one, containing a mucilaginous pulp which is eatable, and a rind so full of tannin, that the natives make an ink from it.

The seeds (of which I have seen one, dead and without its skin) are large amygdaloid bodies, kidney-shaped, and as much as  $1\frac{1}{4}$  inch long, with the taste (in that state) of a Spanish chesnut, but with a bitter aftertaste; at their contraction the plano-convex cotyledons hold together by an axis whose radicle and plumule are both immersed in the substance of cotyledons.

This is Dr. Lindley's account in the *Botanical Register*, it is followed by a botanical description, after which the Professor says:—

"In the total absence of all correct information as to the real structure of this curious genus, botanists have been unable to arrive at any satisfactory conclusion as to its affinities. All that they have been able to settle is its not belonging to any known natural order.

"Palisot de Beauvois stated (1807) that in the opinion of Jussieu, it constituted a new order between *Cucurbitaceæ* and *Passifloraceæ*; a view that was probably taken in consequence of the double-ringed corolla, which is analogous to the coronet of the Passion-flowers, and the plaited corolla, with an inferior ovary, which brings to mind the flowers of the Gourd tribe.

"Desfontaines, on the contrary (1820), refers it and another genus, which he calls

*Astheranthus*, without any doubt, to *Symplocaceæ*, because of its monopetalous perigynous corolla, its stamens inserted in the base of the corolla, its oblong two-celled anthers, single style, inferior ovary, axillary solitary flowers, shrubby stem, and alternate leaves.

"He follows Dr. Robert Brown (1822), who formed it and *Astheranthus* into an order called *Belvisiæ*, without, however, attempting to settle its position in the natural system. He objected to approximating it to *Symplocaceæ*, doubted its affinity to *Passifloraceæ*, and compared its structure with that of *Rafflesia*.

"Latterly no one seems to have attempted to suggest anything new as to its relationship. Endlicher puts it next *Symplocaceæ*. Meisner next *Passifloraceæ*, adding to what had been previously known of it, that its seeds are arillate, a mistake (?) that probably originated in De Beauvois' description of them, '*Semina in pulpâ carnosâ nidulantia*.' Finally, I myself, feeling that these could not be its true affinities, placed it in the *Campanul* alliance, with marks of great doubt.

"It is obvious, from the foregoing description, that *Napoleona* has nothing to do with any of the orders to which it has been referred. From *Cucurbitaceæ* it differs utterly in its hermaphrodite flowers, axile placentation, highly developed corolla, and whole habit; it has in fact no resemblance to that order. *Passifloraceæ* seem at first sight to claim a much nearer relationship; because of the triple-ribbed corolla of *Napoleona*, which much resembles the coronet of a *Passion-flower*; but there the resemblance ceases. The tendrils, parietal placentæ, free ovary, distinct styles, polypetalous corolla, imbricated calyx of *Passifloraceæ*, are all most essentially at variance with the genus. *Symplocaceæ* were a far better guess, for the monopetalous corolla, indefinite epipetalous stamens, axile placentæ, adherent calyx, and definite seeds of *Napoleona* find there a parallel; but the ovary of that genus is wholly adherent, with a great epigynous disk, the calyx is valvate, and the seeds have no albumen, to say nothing of the lacerated condition of the corolla, which is not to be wholly disregarded in a consideration of this kind.

"To me it appears that the true affinity is in the neighbourhood of the Mangroves (*Rhizophoraceæ*); for the following reasons:—The ovary is in both inferior, few-seeded, with axile placentæ; both have a coriaceous valvate calyx; both have large amygdaloid seeds without albumen. The placenta of *Kandelia* is almost the same as that of *Napoleona*, and in the former genus the petals are broken up into numerous fringes quite analogous to those

of the genus in question. To this may be added the great resemblance that exists between the wood of *Napoleona* and of young *Rhizophora*, in consequence of both consisting in part of slender acicular tubes, which give the wood, when broken across, the appearance of containing slender bristles. Finally, the ribbing, which is so conspicuous in the outer corolla of *Napoleona*, is repeated in the calyx of *Bruguiera gymnorhiza*. It is true that the one genus is monopetalous, and the other polypetalous, but I cannot attribute much importance to that character in a case where the stamens adhere so slightly to the corolla.

"While, however, there is this reason to believe that *Rhizophoraceæ* will prove most nearly related to *Napoleona*, the affinity of the genus to some *Myrtaceæ*, is not to be overlooked; as, for example, to *Verticordias*, in which there is the same tendency to a multiplication of the series of the corolla, to *Careyas*, whose fruit has a very similar structure, and to *Barringtonias* to which *Napoleona* is very similar in foliage; but these affinities are less striking than that of the *Mangrove* tribe. They shew, however, pretty clearly that *Belvisiaceæ*, for so it is most convenient to call the order of which *Napoleona* is the most conspicuous member, belongs to the great *Myrtal* alliance." It would seem, at all events, that this novelty is a puzzler even to the botanists themselves.

#### THE DATE TREE.

THE first and best known, and the most useful of all the palms, is, undoubtedly, the Date Tree: it is one of the most valuable productions of Barbary, Egypt, and Arabia, and grows also in several of the Southern countries of Europe. M. Delisle, who was attached to the French Expedition in Egypt, described its cultivation very fully, in a memoir which he presented to the Royal Academy of Sciences at Paris, in 1818.

He stated that it is cultivated from seeds, from suckers, and even from slips. The mode of treatment of the slip, which consists in replanting the top, after having separated it from the trunk, is mentioned by Theophrastus and Pliny; and M. Delisle was assured by the Arabs, that it is still practised.

It is well known to botanists that the Date Tree has the sexes, separately, on different plants; the suckers of each tree producing plants of the same sex. The Egyptians, in order to gain as much profit as possible from their lands, take care to plant no more than the small number of males requisite for the artificial fecundation of the females; and if, from any cause, the catkins of these male Date trees

should not be placed at the proper time and distance, to throw their fertilizing farina on the female flowers, the fruit will not ripen, and the crop will be lost.

A species of palm, less known than the true Date, is the *Nipa*, which grows spontaneously in the Indian Archipelago, on the sea-coast. Rumphius and Thunberg have given but imperfect descriptions of it. The young kernels of its fruit are eaten, when preserved; and if its catkins are cut before they are fully expanded, they will produce a sweet liquor, which, by fermentation, becomes spirituous and very pleasant to drink. Baskets, mats, and other articles are made of its leaves. M. H. Labillardiere observed, and carefully described the fructification of the *Nipa*; and, in several instances, he has rectified the opinions hitherto entertained respecting it. The female flower has three stigmas, and the young fruit three ovals:—the embryo is placed at the foot of the seed. In respect to its male catkins, with sessile flowers, its antheræ borne on a single filament, which is not namified; its female flowers without a calyx, and its aggregate fruits, it strikingly resembles the *Pandanus*; but its spathe, the calyx of the male flowers in six divisions, and the fan-like form of the leaves, produce a still nearer degree of affinity to the true palm trees.

Ancient authors frequently mention an Egyptian tree, to which they give the name of *Persea*: it is said to resemble a pear tree, but its leaves were said to last during the whole year. Its stone fruit was very sweet and wholesome, and the wood, which was black and hard, was extremely valuable. In the Arabian writers of the middle ages we have descriptions of a tree, which they call *Leback*, and which offers all the characters attributed by the ancients to their *Persea*; but, this tree has latterly become so rare, at least in Lower Egypt, that botanists have not been able to fix upon it with certainty. Some of them, as Celsus (and Linnæus, upon his authority), have given the name of *Persea* to a species of *Laurel*; an opinion which is the less admissible, as this *Laurel* comes from America. Others, as Schreber, fancy they have found it in the *Sebastian* (*cordia mixa*); whose viscous fruit, however, is quite different. M. Delisle was more fortunate, having observed, in a garden at Cairo, a specimen of the tree called by Linnæus, *Ximelia Egyptiaca*, he perceived that it possessed most of the characters of the *Persea*. The height was from eighteen to twenty feet, the branches thorny, and the oval perennial leaves were from one inch to an inch and a half in length, which characters may have occasioned its comparison with the pear tree. Its fruit is in the form of the date, is

sweet, when ripe, and contains a kernel, which is rather liguicous. In Upper Egypt M. Delisle met with two others, and he learned from the inhabitants of the higher country, that it is common in Nubia and Abyssinia, and much esteemed at Darfour. He could not learn, however, whether the inner part of the wood is *black*; as the ancients state to be the case with respect to their *Persea*. This tree is called *Eglog*, in Nubia. M. Delisle remarked peculiarities in it, sufficiently strong to separate it from the *Ximenia*, and he made it a genus by itself, to which he gave the name of *Balanites*.

#### THE COFFEE SHRUB.

COFFEE is the berry of a plant or shrub which is very common in Arabia, Felix, and Ethiopia; of both which countries it is a native.

The first use of it as a beverage, is ascribed, by some to the Prior of an Eastern Monastery; who, being informed by a goatherd that his cattle, whenever they happened to browse on the shrub which produced it, would *keep awake* and *caper* all night, was anxious to prove its virtues by trying it on his monks, in order to keep them awake during morning prayers. Other writers ascribe the discovery of it to the Persians, from whom, they say, it was learnt in the 15th century, by the Mufti of Aden, a city near the mouth of the Red Sea; and by him, it was first recommended to his dervises. From Aden, it is said to have passed to Mecca, where it was frequently taken by the devotees, and from thence to Cairo in Egypt. There is no mention of it, either by the Greek or Arabian writers of an early period.

In 1511, Khaie Beg prohibited the use of it, from a persuasion that it caused inebriation; but Sultan Cason, immediately afterwards, took off this prohibition; and coffee advanced from Egypt to Syria and Constantinople, where it soon became the favourite beverage of the Turks: indeed, it has long been established, by law and custom, as one of the necessities with which these people are obliged to furnish their wives.

Rauwolf was the first who made it known in Europe, viz:—about the year 1528; but, it was then only brought from the Levant. The *berry* was long known before the *tree* which produces it: we owe our knowledge of the latter to the Dutch, who procured *slips* from Mocha, which they cultivated in Surinam, as well as in the Botanic Gardens of Amsterdam. The English and French carried it to the West Indies; the Dutch, to the islands of Java and Ceylon; the French, to the Mauritius, and the Bourbon; and the

Dutch and French to Guiana. West Indian and South American coffees are now common all over Europe; but they are considered to be inferior in quality to the Mocha, as well as to the Bourbon, or East India berry. The coffee plant has frequently been raised in hot-houses and stoves in this country, as well as in France and Germany.

Thevenot, the traveller, was the first person who imported coffee into France. *Purchas*, an English writer of the time of James the First, who published a collection of voyages, under the name of “The Pilgrims,” or rather “*Purchas, his Pilgrimage*,” and commencing with the first navigator, Noah, gives us an account of coffee before it had been introduced into Europe. He says, “the Turks have coffee-houses more common than ale-houses with us: in, or near to which, on benches in the street, they will sit chatting most of the day, drinking their *coffa*, (so called from a berry, of which it is made) as hot as they can endure it. It is as black as soot, and tastes not much unlike it, but it is good, they say, for digestion and mirth.”

Sir Henry Blunt, who travelled into the Levant in the year 1634, gives the following account:—“The Turks have another drink, not good at meal, called *Cauphè*, made of a berry as big as a small bean, dried in a furnace and beat to powder, of a sooty colour, in taste a little bitterish, that they seethe and drink, hot as may be endured. It is good all hours of the day, but especially morning and evening; when, to that purpose, they entertain themselves two or three hours in *Cauphè*-houses, which throughout all Turkey abound more than inns and ale-houses in England. It is thought to be the *Black Broth* used so much by the Lacedemonians: it drieth ill humours in the stomach, comforteth the brain, never causes drunkenness nor any other surfeit, and is a harmless entertainment of good fellowship; for, there, upon scaffolds, half a yard high, and covered with mats, they sit cross-legged after the Turkish manner. Many times, two or three hundred together, talking and telling wonderful stories, with, not unfrequently, some poor *music* passing up and down.”

A Greek servant, named *Pesqua*, brought into England by Mr. Daniel Edwards, a Turkey merchant, in 1652, merely for the purpose of making his coffee, is stated by several writers, to have been the first who ever set up in the business of a “*coffee-man*” for the public at large: in fact, he was the person who introduced coffee as a common beverage in this country. Others state that it was recommended, at an earlier period, to his patients, by the celebrated Dr. Harvey; and, that the



first coffee-house was opened at Oxford, in 1650, by one Jobson, a Jew. Arthur Tilliard, a London apothecary, sold it publicly at his own house in 1655. In 1671, the beverage had become so general, that the Oxford Jew removed from thence to the metropolis, where he soon carried on a most thriving business.

In Arabia, Felix, and Ethiopia, the Coffee Tree is full of flowers and fruit, throughout the whole year: the inhabitants gather the berries twice or thrice in the year, and lay them in the sun to dry; when the pulp and skin separate from the seeds by rubbing. In the populous city of Mocha, on the Red Sea, the most considerable trade carried on by the inhabitants, (Turks,) Jews, Armenians, and Persees) is in coffee, which is cultivated at *Beetlefuckie*, and is allowed to be the finest in the world. The caravans which go from Constantinople to Mecca, carry back immense quantities of this berry into European Turkey, with all the spices and manufactures of the Eastern world: on account of this circuitous land route, (as regards the north of Europe,) when Mocha, or Arabian coffee finds its way into Germany, France, and England, it has been usual to call it *Turkey* coffee. In the same way, previously to the discovery of a sea passage to India, British merchants who imported Indian goods overland, through the Turkish empire, were designated *Turkey* merchants: the same class, since the commencement of the present century, have been styled *East India* merchants.

The Coffee Plant grows to the height of about 8 or 9 feet, and is something like our white-thorn bush. The branches or twigs, grow in pairs, and opposite each other: the leaves grow in the same manner, in opposite pairs, and about two inches asunder. The leaves are about four inches long, and two wide in the middle part; from whence they decrease towards the extremity, forming a sharp point, like the bay-leaf; but, they are neither so stiff, crisp, nor thick. The bark is grey and smooth; and the wood white, with very little pith. The fruit hangs on the twigs in small clusters; the plants are watered by artificial rills, or channels; and, after three or four years bearing, the Arabs plant new shrubs; the old ones beginning to decay after that period: the berries are dried by the heat of the sun, after being carefully picked from the shrub; and the husk is afterwards taken off, by passing the fruit through handmills. In the hot season, the Arabs use these husks instead of the berries; and esteem the liquor impregnated by them, to be more cooling and refreshing than that prepared from the berry itself.

The Turks are as fond of coffee, as the Chinese are of tea; and their method of preparing it is much better than that practised by the inhabitants of Northern Europe: the difference, however, lies chiefly in the process of *roasting*; during which the Turks take care that none of the aromatic portions shall fly off. Similar care is taken in the *boiling*. The Greeks, too, are excellent coffee makers; next to them, are the Sicilians, the Italians and the French. Afterwards come the Swiss, Spaniards, Germans, Dutch, Swedes and Russians, the worst of all are the English; who roast and grind the berries carelessly, and in too great quantity at a time; and also boil it to such a degree that all the aromatic particles fly up the chimney: the Turks drink their coffee copiously, without either milk or sugar; and too often to its frequent use, join that of opium: the habitual use of both renders those who take them, weak, stupid, and short-lived.

The Persians are great coffee drinkers, and also, *coffee-eaters*:—the author of the "*Pil grimage in Persia*," whilst relating that, at Bebuham, he was honoured with visits of ceremony from Magnates and aristocracy of that place, and that they were greatly diverted with the difference between their dressing and customs and his own, says, "Khans and Meerzas Bebuhan are considerable consumers of coffee; but, not after the fashion of Turks, Arabs, or Europeans. It is with them a kind of *bon-bon* eaten in a roasted and powdered state, without having any connection with *hot-water*. When Meer Goolam Hussein called on me, he was always accompanied by his *Coffee-bearer*, who carried about the fragrant berry in a sort of *snuff-box*, and frequently handed the same to the company present. The first time it was brought to me, deceived by its colour and quality, and strengthened in the delusion by its singular repository, I took a *pinch* of the coffee and applied it to my nose, amidst the roars of laughter and looks of surprise of the whole party."

Both East and West India coffee are inferior to the Turkey, or Mocha berry; but the South American is the worst of all; more particularly when rendered acrimonious by being *soaked in sea water*; a trick formerly practised to a great extent, for the purpose of increasing its weight.

Sir Thomas Stamford Raffles, in his History of the Island of Java, states, that, while in Ceylon, Bourbon, Jamaica, and other West India Islands, &c. the cultivation of the Coffee Plant is left to the discretion and interest of the native, or plants in Java, it is quite otherwise. "In this island," says he, "the Coffee Plant, which is known only by its Eu-

ropean appellation, and its intimate connection with European despotism, was introduced early in the 18th century by the Dutch; and has ever since, formed one of the articles of their exclusive monopoly and exaction. The labour, by which it is planted and cultivated, and its produce collected, is included among the oppressions, or forced services of the natives; and the delivery of it into the government stores, is among the forced deliveries at inadequate rates. Previously to the year 1808, the cultivation of coffee was confined chiefly to the Sunda districts: there were but comparatively, few plantations in the Eastern districts; and the produce which they were capable of yielding, did not amount to one tenth part of the whole. Under the administration of Marshal Daendels, however, this shrub usurped the soil destined for yielding the substance of the people; and every other kind of cultivation was rendered subservient to it. The withering effects of this government monopoly soon became extended throughout every province of the island.

In the Sunda districts, each family was obliged to take care of 1000 coffee plants; and in the Eastern districts, where new and extensive plantations were formed, on soils and in situations in many instances unfavourable to their cultivation, 500 plants were the prescribed allotment. No negligence could be practised in the execution of this duty; for all the operations of planting, clearing, collecting, &c., were conducted under the immediate superintendence of European overseers. These selected the spots where new plantations were to be laid out; took care to see that they were preserved from weeds and rank grass; and received the produce into store when gathered.

In Java, the coffee tree, in certain elevated situations, yields fruit during 20 years; indeed, the greater the elevation of its site, the longer is the period of its productiveness, and the finer the flavour of the berry.

About six feet is the distance preserved between every two plants; and, in this island, they grow to the height of about 16 feet. The general average of the produce of a single tree, is about *one kati*, or one pound and a quarter; although some trees yield from 20 to 30 *katies*. The Sunda districts afforded annually 100,000 *pikuls*, of 133 pounds each; or about 13,300,000 pounds; or 6,000 tons weight: it was expected that the Eastern districts would yield a similar quantity. Sir T. S. Raffles calculated that under a free and proper system, coffee might be raised for exportation at 40 shillings per hundred weight. During the last years of the British administration in Java, and when the opening of the European markets, after the French war, had afforded a

demand, about 11 millions of young coffee trees were planted out in new gardens. M. Hogen-dorp, an old Dutch resident, states, that Java can, without difficulty, yield 50 millions of pounds of coffee annually. The excellency of the Java berry is well known in the European markets; indeed, in comparison with those of other countries, its quality and price have been equal if not greater, during several years, than that of Bourbon; both being of course, higher than the produce of the West Indies.

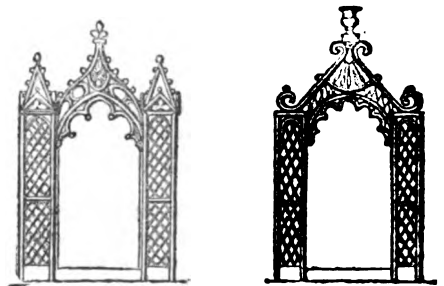
It is necessary now, to say a few words respecting the dietetic qualities of this aromatic berry. In most countries it is a decided favourite, on account of its exhilarating qualities; and, doubtless, were it taken in moderate quantity, with the proper accompaniments of cream and sugar, it would not impair the digestive power, nor injure the constitution in any way; but when it is taken in the shape of a very concentrated infusion, without either sugar or cream, as by the Turks, and other nations, it must have a pernicious effect on the stomach, and, indeed, determined coffee drinkers are generally afflicted with heartburn and indigestion, and were it not for the defensive and dilutory action of solid viands, and nutritious liquids, the stomachs of many of them would be completely destroyed. But, the best way of dealing with this important question, as regards the public health, is to quote the result of a REPORT lately made by medical and other commissioners, to the Swedish government on the subject. It seems that the inhabitants of the province of Dalecarlia, in Sweden, had, until the end of the last century, been considered to be the most healthful, the handsomest, the most beautiful, and the most happy of all the inhabitants of Sweden. About that period, however, it was observed that a great variety of maladies, *till then unknown*, appeared, and worked a considerable change in the general health; moreover, that the people had fallen from that condition of ease and pecuniary comfort, which they had hitherto maintained. It was observed also, that in particular districts of the province, *no change* had taken place; that the inhabitants enjoyed the best possible health; and that their circumstances remained as heretofore. The solicitude of the government authorities being directed to these facts, and enquiries into their causes instituted, the result (which was only recently published) is, *that the use of coffee is the sole cause of the sinister change which has taken place in the health and condition of the people*; that wherever the people have *abstained* from this beverage, their health and circumstances have in all respects, remained *unchanged*. The REPORT in question, goes so minutely into particulars, that it seems

impossible to be mistaken as to the validity of the causes which it assigns for the effects in question. Supposing, therefore, the above inference to be correct, may it not be questioned, whether the premature loss of beauty among the females of *Switzerland*, the peculiar tint which overspreads their complexions, though hardy mountaineers; and the universal ill-health which prevails among them, may not be attributed to the habitual, nay *twice-a-day*, use, of this fragrant, though perhaps noxious berry? of which, there are consumed in *Switzerland*, no less than *Twenty millions of pounds* annually.

#### EXOTIC NURSERY OF R. BUIST.

SINCE 1841, Mr. Buist has considerably enlarged his city grounds. Since our visit, Mr. Buist has erected another new house, which is heated on the tank system, and he has kindly promised to give us the results of this mode of applying heat, as compared with copper or iron pipe and brick flues. Mr. Buist has a large and choice collection of plants, and has lately made many additions. Passing through the houses, we noticed several new species *Oxalis*, viz. *O. purpureus*, *lanatus* and *elongatus*, the two latter, we believe, received from the exploring expedition. Among the Cacti, we noticed some new *Echinocactus*, and a fine stock of *E. Eyriessii*, *Rodánthe*, &c. In the greenhouse we saw fine specimens of *Achimenes longiflora*, *Chorizema ovata*, and *varium*, and *Genista ramosus*, the three latter most desirable greenhouse plants, not often seen in collections. Mr. Buist also has a good collection of *cinerarias*, a tribe of plants now attracting great attention among the English florists, and deservedly too, for there are but few plants which add more to the gaiety of the greenhouse than the varied shades of their star shaped blossoms, abundantly produced throughout March, April, and May; we must recommend to amateur cultivators the production of seedlings, in order to obtain new varieties. The general collection of plants has not yet been arranged for the winter, and we found it a work of more time than we had to spare, to note down many of the more interesting objects. In the greenhouse at the nursery at Moyamensing, we noticed immense quantities of seedling camellias, which, if one plant in one hundred produces a flower worthy of preservation, will furnish our collections with a great number of new varieties. Mr. Buist has already raised two very superior kinds, *Martha* and *Práttii*: the former a remarkable white, and the latter a beautiful rose coloured one. We believe we noticed Mr. Buist's

method of growing his camellias in our last account of his garden; which was to keep them in shallow pits, just deep enough to admit the plants; in this way they keep better than in the open air, do not require near so much care, are easily shaded from the hot sun, and their foliage acquires a deep green and healthy hue. In gardens of limited extent, and where there is little or no shade, we would recommend the same mode of summer protection from our scorching sun and drying winds. Mr. Buist showed us in the open garden, a patch of the *Prairie* strawberry. It has a large and vigorous looking leaf, but it has not yet fruited, and its merits are yet unknown. Our seedling strawberry, Mr. Buist considers the finest variety he has ever cultivated; he showed us a seedling raised from it which, though a very good sort, was wholly unlike the parent in size and beauty; this is at least the third instance where we have known seedlings raised from it, which have turned out to be small and almost worthless varieties; this fact shows conclusively its hybrid origin. The demand for plants of our seedling has been so great that but few, if any, really fine fruit have been obtained here; the present season we hope our Philadelphia friends will see it in all the perfection it has been exhibited at the meetings of the Massachusetts Horticultural Society, when it again obtained both the 1st and 2nd premiums of the last season. We intended to have made some remarks upon Mr. Buist's collection of roses, to which many new kinds have been lately added, and among others *Noisette Solitaire*, one of the new yellow roses, of so much merit; but our time would not permit us to take down scarcely any memoranda, even what we have already written having been from a recollection of what we saw in our hasty walk through the grounds.—*Hovey & Son, Boston.*



SKETCHES FOR VERANDAHS.

## GARDENING IN ENGLAND.

IT is worthy of remark, that a taste for gardening has kept pace with the growth of the sciences and the march of civilization; clearly proving the influence which it exercises upon the passions and feelings of mankind. All the enjoyments of life, therefore, as well as the sciences, owe much to this delightful study; hence medicine derives also almost all its power, and the pharmacopœa of physic is dependent on the simples prepared from plants and herbs. The science of architecture derives nearly all its beauty from the study of vegetable nature, if its very existence as a science may not be principally traced to the same source. Certain it is, that the decorative portion of it was originally derived from flowers and plants. The embellishments of Indian buildings are evidently modelled from the lotus-flower, and the first idea of columns was first suggested to the ancients by the palm-tree. We are told that Hiram ornamented the celebrated pillars that he wrought for Solomon, with lilies and pomegranates.\* The beautiful enrichment of the Corinthian capital was an accidental discovery arising from the same cause. Callimachus, a celebrated architect, was engaged to make some pillars at Corinth: during the time, he happened to pass a basket covered with a large tile; this having been placed on the ground over a root of the acanthus, the stalks and leaves had spread outside the basket, and they were thrown back again at the top by the corners of the tile: the elegance and novelty produced by the beautiful appearance of this chance arrangement so delighted Callimachus, that he immediately adopted the form of the basket, with the leaves of the acanthus as a capital for his pillars.†

The Chinese seem to have modelled their pagodas after some species of pine-trees. The most beautiful enrichments of English sculpture are those where leaves of flowers are introduced, and the Gothic tracery of some of our cathedral antiquities abound with this style of ornament. The general forms of enrichments may be thus classed, observes an old British architect: "The Gothic are derived from the bud, or germ, the Grecian from the leaf, and the Indian from the flower: a singular coincidence which seems to mark that these three styles ought to be kept perfectly distinct."‡

When the eastern nations were at the height of their glory, the art of gardening was carried to great perfection. Cyrus the younger was celebrated for his pleasure-gardens in Lydia, which had been planted and attended by himself, equally with the elder Cyrus, as the found-

er of the famous palace at Persepolis. Of all the eastern nations, however, the ancient Israelites seem to have left fewer records of their love of this delightful pursuit, probably for the same reason that few, if any specimens of their sculpture have been transmitted to later ages. They were surrounded on all sides by idolaters, and the commands of the Deity delivered through Moses and his successors, in order to preserve the pure worship of God, prohibited almost all intercourse, and more particularly the adoption of their habits and customs, which, to the profligate portion of the nation, were very attractive and alluring. The religious rites of the heathen were generally celebrated in their gardens or sacred groves; these, as public plantations therefore, as well as images, were forbidden by the Jewish laws. It is clear from the various narratives of the cutting down and constant destruction of the groves by different monarchs in succession, that the fondness for this pursuit was continually showing itself, although it is also evident that its constant companion and associate was idolatry. Almost every nation in its earlier or rude history has had some disposition to the same mode of worship. Altars were reared in the groves and gardens, upon which sacrifices were offered. We need not travel further back than the history which our own country supplies, for evidence: our Druidical forefathers worshipped amid the shelter of their groves, which were planted and preserved for the sacred purposes of religion.

Of all the gardens of antiquity but two elaborate descriptions have been handed down to us, viz., those in the neighbourhood of Jerusalem, laid out by Solomon, for which see the Canticles, &c., and those, of which Chardin gives us a most glowing description, in the vicinity of Babylon; the Royal, or as they have been styled the Hanging Gardens there, seem to have been the *chef d'œuvre* of art. The following description is from Sylvia Florifera, and we cannot do better than give it entire.

"These extraordinary gardens appear to have been formed by Nebuchadnezzar \* for his Median queen, who, we are told, could not become reconciled to the flat and naked appearance of the province of Babylon, but frequently regretted each rising hill and scattered forest, which she had formerly delighted in, with all the charms they had presented to her youthful imagination. The king, to gratify his consort within the precincts of the city, raised terraces and planted woods, in imitation of those that diversified the face of his queen's native country. Thus originated those gardens, which for their singularity and comparative extent were

\* 2 Chronicles iv. † Flora Historica. ‡ Repton.

\* Some say Cyrus; it is, however, certain it was not done by Semiramis, who founded the city.

considered one of the wonders of the world. Their base covered four acres of land, and the height of them was so considerable, that they resembled a pyramidal mountain covered by a forest; the upper area, which was about thirty feet square, was about three hundred feet distant from the river Euphrates, that washed the base of the stupendous superstructure.

"This towering pleasure-ground overlooked the whole city and surrounding country as far as the eye could reach. Each terrace was covered with earth and planted with trees, so as to form a series of ascending groves; and every platform supported rural seats, fountains, and sumptuous banquetting-rooms, on which all the splendour and luxury of Eastern magnificence were lavished. This edifice was constructed by immense stone beams laid on pillars of stone, the first flat being a square of about four hundred feet each way; these flats, or stones, lessening in surface as they increased in height. The stones were first covered with reeds, cemented together by bitumen. On this covering was laid a double row of bricks, united by cement, which were then covered also by sheets of lead in order to prevent the moisture from penetrating downwards; and these sheets lastly sustained a depth of earth sufficient for the plantation of trees and shrubs. We are told, that this elevated shrubbery was watered by fountains, the water of which we presume to have been conveyed into it by manual labour, as skill in hydraulics appears to be an acquirement of later times; and perhaps the ancient Egyptians, from their peculiar situation and circumstances, were the only people who attended at that period to the science."

Damascus has also been justly celebrated; its situation was delightful, and its gardens laid out in the choicest taste. Mahomet, when beholding this beautiful city from a commanding eminence, declared that he should not venture to enter the terrestrial, lest he should not enjoy the celestial, paradise, as no man could enjoy two. The Koran, the rule of Mahometan faith, teaches its believers that the enjoyments of a future state consists in dwelling in beautiful gardens in the society of the *houris*. One of its declarations is, "Whoever doth good works, either man or woman, and believeth, shall enter paradise. They shall enter gardens of pleasure, together with those of their fathers or wives that have done good."\*

The ancients, as we see, therefore, had their pleasure-grounds, and among the most civilized they were principally made subservient to the pleasures of the fair sex. Jerusalem, as we have before noticed, had its gardens for

this purpose, which Solomon has so beautifully celebrated in song. Plautus assigned the direction of gardens to Venus; and Pliny tells us that the management of a garden in his day belonged to the softer sex, and it was a common practice to judge of their qualities as housewives by the orderly appearance of their gardens.

Much I love  
To see the fair one bend the struggling pink,  
Cheer the sweet rose, the lupin, and the stock,  
And lend a staff to the still gadding pea;  
Ye fair it well becomes you. Better thus  
Cheat time away than at the crowded rout.  
*Village Curate.*

Of the skill or taste of the Greeks in cultivating their gardens we are not in possession of any clear information, even during the highest splendour of their republics. Cimon, the Athenian general, laid out the *Academy* at Athens, about 430 years, B.C., and this as well as other gardens, was said to consist of walks shaded by plane trees, watered by streams, and enclosed by walls,\* to which the *Gymnasium* was added, where exercises which accorded with the warlike habits of the people were performed. The gardens of Epicurus, a little later, were celebrated both for their beauty and the lectures which he delivered in them; the one he had at Athens was the first of the kind in the city that was attached to a dwelling-house, and was said to have cost him about eighty minoe, or two hundred and sixty pounds, a very considerable sum in those days; their writers have given us a favourable idea, however, of their horticultural skill, notwithstanding their gross superstition, and we find violets, roses, narcissi, irises, &c., were sold at Athens, and used as ornaments on all occasions; the same arts only modified perhaps a little by climate, had been successively practised by the Egyptians, the Chaldeans, the Medes, the Persians, the Macedonians, and the Greeks, as they each rose into powerful monarchies; and from the scanty information which has reached us, we can yet conclude that some of the most recondite practices of the gardener were known and followed at this early age. The continent of Asia rapidly increased in population, and the various empires sent forth at different periods colonies into the surrounding districts; the Greeks peopled the whole of Asia Minor, and passing into Italy, thence descended the Romans, who it is certain took great delight in cultivating their pleasure-grounds, and improved under the best master, Practice; so that at the time of the Christian era, every person of consideration possessed a country villa.

The Romans deemed horticultural pursuits

\* Surat, c. xi. v. 43; xiv. v. 95.

\* Pausanias, b. i. 29.

so honourable, that the surnames of many of their distinguished families were derived from some fruit or vegetable which they excelled in cultivating. Hence the Piso, the Fabii, the Cicero, the Lentuli, and others; even their dictators were summoned from the plough and the spade to undertake the cares of government, and returned again to the cultivation of their grounds when they resigned them to other hands.

When they conquered Britain, as was their practice in colonizing a country, they introduced their pursuits in science among the inhabitants, and with them the style of gardening they were accustomed to in Italy; under the feudal system and in baronial times, when beyond the boundary of the castle wall nothing was secure, this was lost; yet, still was to a certain extent their system preserved, and during the middle or dark ages, when knowledge slept upon the shelves of the fathers, gardening was pursued with attention only by the inhabitants of the monastery or the convent, which had grounds of considerable extent attached to them, where flowers, shrubs, fruits, potherbs, and medicinal plants were cultivated.

The inhabitants of London had gardens attached to their villas at a very early period indeed, Fitz Stephen tells us that they were "large, beautiful, and planted with trees;" this was during the reign of Henry II. In Henry III's time, a curious style prevailed, as every ground-plot was laid out with labyrinths and parterres, as may be seen in "Cercean's Architecture." The first park of which we have any record, was formed at Woodstock by Henry I., A.D. 1123, and, according to Spelman, the idea was taken from the East-erns. It was chiefly intended as a game preserve (*habitationem ferarum*);† this, however, contained the labyrinth termed the "Bower," which has figured on the page of history in connexion with the fate of the unfortunate mistress of this monarch, Fair Rosamond: at that time, namely, in the reign of Henry III., the gardens belonging to the villas and noble mansions in the Strand were upon the most splendid scale. The Royal Gardens of Nonsuch, Surrey, appear to have been formed about the time of Henry VIII., of which Le-land says—

Unrivall'd in design, the Britons tell  
The wondrous praises of this nonpareil.  
This, which no equal has in art or fame,  
Britons deservedly do Nonsuch name.

And, about the same period, those at Hampton Court, by Cardinal Wolsey, still famed for the labyrinth which covers only a quarter

of an acre of ground, yet extends, by the volutions of its walks, over nearly half a mile.

During the sojourn of Charles II. in France, he imbibed their ideas; as did also Evelyn, during the commonwealth; and formal avenues, and a stiff geometrical style obtained for a considerable period. And it was at this time that Le Notre, who had planned the celebrated gardens at Versailles, came over to plant St. James', and Greenwich Parks. But while this heavy style of gardening exhibited scenes which were every way tasteless and insipid, and which would lead us to conclude that those who planned them imagined the further they wandered from nature, the nearer they approached the sublime; the art of gardening continued to advance, and, in the concluding years of this period, had progressed very considerably.

We have thus endeavoured briefly to trace the influence which a taste for the cultivation of flowers has had upon mankind generally, throughout all ages of the world, and shown particularly that to this taste we owe almost all that is beautiful in simile and delicate in expression in the sweet breathings of poetry. Continuing our inquiries, we have marked the progress which gardening, as a science, has made from the nations of remote antiquity, down to the period of our own history, bounded by the short existence of the commonwealth. We shall return again to this subject on a future occasion, and shall merely, in concluding this paper, notice a few of the advantages derivable from this pursuit. First, it may be said to attach a man to home: this of itself should furnish an argument to encourage and increase a taste for gardening. Secondly, as a recreation it conduces to health. Thirdly, it promotes civilization, and softens down the asperities of a man's temper and manners in common life. Fourthly, it leads to a study of nature, which naturally tends, from a contemplation of the wonders of the vegetable kingdom, to direct his mind to contemplate the Divinity, and admire his providence, and the beauty, contrivance, and design conspicuous in all his works. Goodness and power united, meet him at every step; the intellectual eye is feasted, and a delight is produced which, unlike every other species of excitement, leaves behind it no inquietude. The heart overcome with grief—the sight fatigued with exertion—the mind overstrained with business—find, in the verdure of fields adorned with flowers, both comfort and refreshment: added to which, the necessary consequence of engaging in this study produces a habit of arrangement, a perception of order, distinction, and subordination, which few other studies can bestow, and

† Henry of Huntingdon's History, b. vii.

which is of use in all the concerns of life. The bodily senses, too, are highly improved by that accuracy and observation which are necessary to discriminate the various objects that are continually passing in review before them.

Of all the studies that can occupy man, none yields more pleasure in its pursuit than botany; it furnishes an infinite variety of objects for the mind to dwell upon, engaging its attention with pleasures as rational as they are innocent—as pure as they are intellectual: the wisest of mankind have cultivated it. Like the bright host of stars which bespangle the firmament, vegetables and plants have been profusely scattered over the earth to invite us to examine them as matters of curiosity, pleasure, and instruction. While, however, the luminaries of heaven are placed at such a distance from us that it requires some knowledge of mathematics, and the use of powerful instruments, to bring them within the range of our senses; plants form the natural carpet on which we tread, they grow beneath our feet, and we can contemplate their structure and uses without much difficulty; they seem to invite our attention, and the only instruments we need are a needle and a magnifying-glass, or a pocket microscope at most.

For it is not alone in the radiant orbs above, their astonishing magnitude and regular order, that the Deity is conspicuous; but he is equally so in the beautiful structure and colours of a flower or a leaf, and in those portions of animated nature, which are the objects only of microscopic vision.

“In animalcules, germs, seeds, and flowers,  
Live in their perfect shapes the little powers,  
Vast trees lie pictured in their slenderest grains  
Armies one wat’ry globule contains;  
Some so minute that to their fine extreme,  
The mite, a vast leviathan would seem:  
A world of beauties that, thro’ all their frame,  
Creation’s grandest miracles proclaim.”

While we, however, thus study nature, we should remember that we do so, not merely for the gratification of curiosity, or the amusement of a vacant moment, but for the nobler purpose of acquiring and diffusing instruction; for it has been justly remarked, that “not he alone, is to be esteemed a benefactor to mankind, who makes a useful discovery, but he also who can point out and recommend an innocent and useful pleasure.”

Botany previous to the reign of Elizabeth was almost unknown as a science, and horticulture was looked upon in no other light than as a mechanical art; but upon her accession brighter days began to dawn upon it, and it was soon seen that botany formed the principal part of the only foundation upon which

an enlightened practice of horticulture could rest. The first establishment formed upon any regular plan for the scientific cultivation of plants, was made in this reign by Gerarde, who formed his physic garden (1567), although the first royal professor of botany may be said to have been appointed by Richard II. (1377-1399), who allowed John Bray an annual pension for his knowledge and skill in botany and physic. John Gerarde lived in Holborn, and here it appears was his physic garden situated. He attained considerable eminence as a surgeon, and had travelled when young up the Baltic: he had a large collection of plants, exotic and indigenous, amounting to above 1100 sorts—his catalogue describes 1033 species—he was patronised by the great Lord Burleigh, who was also a great admirer of plants, and who had a better collection than any other nobleman in the kingdom. A desire for the study and knowledge of plants, and their cultivation, seemed to pervade Europe simultaneously at this period; on the continent it had become popular, which our ancestors speedily followed, so that “many tributary streams began to flow into this branch of the river of science.” Padua took the lead, where, whilst it was under the Venetians, a public botanic garden was established in 1533. Lucas Ghinus, the first public professor of botany in Europe, strongly advocated such institutions, and through him a similar garden was established at Bologna, where Dr. Turner first imbibed the knowledge of plants which afterwards rendered him so celebrated. On the continent several private gardens of the same kind were formed. We find Enricus Cordus at Bremen, had one about 1530, and Mordecius at Cassel. Gesner constructed the first botanic garden in Switzerland at Zurich, 1560; that of Paris was established 1570; Leyden, 1577; Leipsic, 1580; Montpellier, 1598; Jena, 1628; Oxford, 1632. Henry Danvers, Earl of Danby, gave five acres of ground on the banks of the Charvel for the establishment of this last, where he built green-houses and stoves, enclosed it with walls fourteen feet high, and munificently endowed the establishment; one was endowed at Edinburgh in 1680 by Sir Jacob and Sir Andrew Balfour; that at Chelsea was founded in 1673 by the Apothecaries’ Company; this establishment was exceedingly expensive, and the company have deservedly stood high in public estimation for their zeal to promote the objects of science in this, as in many other instances; being undertaken when the society was without funds, they were obliged to have recourse to the private resources of its members for the purpose, and no pecuniary advantage appeared likely to be derived from the outlay. At this

period botany as a systematic science, could be scarcely said to exist; systematic arrangement, beyond that of alphabetical order, was barely thought of. Generic and specific characters were scarcely regarded. All herbalists were florists, and in both capacities the chief object was to discover and introduce new plants, for they could not then distinguish between species and variety. All the celebrated men in these days were raisers of "florists' flowers," they sought to increase their knowledge of individuals, and left a detached mass, which Ray, Tournefort, Linnæus, &c. afterwards simplified and arranged.\*

The advantages derived therefore by the establishment of botanic gardens were of the first importance. No plant, unless its native climate, soil, and habits are attended to, can be cultivated with success. Here, therefore, where plants could be associated in cultivation, the scientific man could pursue his favourite study under circumstances not to be otherwise attained; ascertaining their relative characteristics, comparing doubtful species, witnessing their state at different periods, the soils and atmosphere that best suited them, &c.

This improvement in knowledge was not confined to botany alone, the whole circle of the arts and sciences partook of it; by emancipating the human mind from servile thralldom, the reformation taught man, instead of blindly bowing to that which custom and antiquity had consecrated, to have a self-dependance, to search all things, and retain only that which was good; it gave an impetus to improvement, and stirred up a spirit of inquiry which no tyranny could check, and like a stream which had been pent up within narrow bounds, when once the floodgates were open it rolled rapidly onwards to the ocean of knowledge. Then arose such men as Bacon, Peiresc, and Evelyn; and while the path which men of science should tread was traced by the first, the last lent their talents and wealth to assist them whilst engaged in the pursuit. Bacon taught that experiment and observation alone was the foundation of true knowledge; that facts and not fanciful or metaphysical theories were the materials with which he could hope to raise any solid superstructure, that man, as the servant and interpreter of nature, could discover truth only as he observed or imitated her operations. Peiresc was a man of letters, whose purse and advice were open to all the scientific men of the day; possessing a good library and a garden of choice plants, he delighted to spread them over all Europe, a liberality of feeling which did honour to the individual, and which we could

wish to see carried out into operation more extensively even at the present day. Evelyn trod closely in the same steps. He possessed a beautiful spot at Saye's Court, in Kent, and was one of the first fellows, and of the council, of the Royal Society, on its first formation in 1662. This age has been truly called the "golden," if we consider the list of bright names which in all departments of science and literature, adorned it, and especially in botany and chemistry; horticulture and floriculture began rapidly to rise from the empiricism in which it had been involved. A spirit of research became prevalent, foreign voyages, for profit as well as fame, were undertaken by Raleigh and Cavendish, and Raymond and Lancaster, and Spanish America and the East Indies began to contribute the gems of their vegetable productions to the collections of Europe; rare plants of every description were sought after, and some, such as the potato, tobacco, and tea became, from mere novelties, to be regarded either as the necessities or the luxuries of life.†

Much additional information had been obtained, and new varieties of flowers introduced during the reign of Elizabeth, who was herself passionately fond of flowers—from the settlement of the Flemish worsted manufacturers at Norwich in 1567, during the persecutions in their country under Philip II. and the Duke of Alva—they brought with them gilliflowers, Provence roses, and carnations; tulips, and the damask and musk roses, would appear from Gerard to have been known for some years, as he says, in 1596 a collector of tulips had been so for twenty years, and had an immense variety. The Flemings, it would also appear, established "shows," as there is mention of a "florists' feast" at Norwich so early as 1637, when a play termed "Rhodon and Iris" was performed.‡

The fondness for flowers began now to spread itself far and wide—it pervaded every rank, and the nobility of every county and the artisans of every manufacturing town in the kingdom are mentioned as delighting in their cultivation.

In Holland, where this passion began, it was carried to the greatest excess, and degenerated at last into a series of gambling transactions, which continued until the middle of the last century, when two hundred pounds were given for a hyacinth root; and the *Semper Augustus* tulip fetched a price almost exceeding belief. The most distinguished patron of gardening in this reign was the Lord Keeper, Sir Nicholas Bacon, whose chief care and attention was be-

† History of English Gardening.

‡ Linnæan Trans. ii. 296. Ray's Catalogus Cantabrigiæ.

\* History of English Gardening.



stowed on the gardens attached to his beautiful mansion at Gormanbury.

The company of gardeners was formed in the third year of James I, who made them a corporate body, with a master, warden, and assistants, and it was composed of the gardeners of London, and six miles around it. The preamble to their charter states, it was granted on account of the disappointment caused by defective samples of seeds, &c. being supplied to the public. They possessed very extensive powers and privileges—no one being permitted to practice as a gardener unless first approved by the company. Such days as these, when corporations monopolized to themselves the advantages which all parties in a community whose industry entitles them to it ought to share, are fast passing away, legal enactments or restrictions in conducting private business are mostly injurious—never beneficial: they are hostile too, and generally retard improvement, and are in most cases worse than useless. We cannot, however, but perceive how extensively gardening was at this time pursued, when disappointments in its products was considered worthy of such protection. This charter was confirmed in the 14th year of the same reign. The second royal botanist of whom we find any mention, was appointed by this monarch, in the person of Matthias de Lobel, who was under the patronage of Lord Zouch: his garden, the expense of which was borne by his lordship, was at Hackney.

In the succeeding reign, that of Charles I., gardening met with universal patronage. The king being very fond of it, he conferred the title of Royal Herbalist on Parkinson. Orangeries were much attended to by the nobility: the queen, it is said, had one at Wimbledon, where there were 42 trees, each valued at 10*l*. During the reign of Charles II. gardening continued to improve greatly, and it appears that glazed houses, for the protection of tender plants, were now first erected; the one at the Chelsea garden has been minutely described by Evelyn. The gardens and greenhouses at Fulham palace were, during the time of James II., greatly extended by Bishop Compton; this prelate appears to have been an indefatigable collector, possessing withal a correct and scientific taste, and he was said to possess a greater variety of plants than could be found in any other part of England. Such rapid strides had horticulture and gardening made in England at the period we are considering, that Holland, who had first imparted the impulse was left far behind, and we strove for the mastery with France, to whom we had been also in the situation of pupils. Louis XIV. at this time swayed its destiny, and his weaknesses contributed in no small degree to

the advancement of the arts and sciences; for, while they ministered to the gratification of his passions, he became their munificent patron. It was to this monarch that the splendid gardens of Fontainebleau, Marli, and Versailles owed existence, and the gardens of the nobility were upon a scale worthy the prevailing taste, among which those of St. Cloud, belonging to the Duke of Orleans, deserve particular notice. In the time of William III. and Mary his queen (1689–1702), the Dutch style was introduced into England. Dr. Tillotson, in her funeral sermon, mentions her fondness for the pursuit. She delighted in exotics, and allowed Dr. Plunket 200*l*. per annum for his assistance in collecting, &c. Up to the period to which we are now arrived, the same stiff, formal taste prevailing in the laying out of gardens, and the only difference that existed was the expensive and splendid scale upon which it was carried into effect.

Each alley has its brother,  
And one half the garden just reflects the other.

The extension of these deformities hastened the introduction of a better taste; and the reign of Anne (1702–1714) we date from as the era whence arose a natural taste for design in gardening. The dawn had at length broken, and during the 18th century it burst forth in meridian splendour. The united efforts of the poets and painters of the time had been paving the way for this great change. Claude Lorraine, the Poussins, Salvator Rosa, and a few others, felt the force of that harmonious union of the elements which Nature herself employs to produce all the varied scenes of beauty visible in the natural landscapes around us, and transplanted them to their canvass with such felicity, that they will remain objects of admiration to the latest period of time; but many prejudices were to be removed—many gradual ascents made from bad to good before the delicious amenities of a Claude or a Poussin could be rivalled in a Stourhead, a Hagley, or a Stow, or the more tremendous beauties of a Salvator Rosa equalled in the scenes of a Piercefield or a Mount Edgecombe.

Oh! how unlike the scene my fancy forms,  
Did Folly, heretofore, with Wealth conspire  
To plant that formal, dull, disjointed scene,  
Which once was called a garden. Britain still  
Bears on her breast full many a hideous wound,  
Given by the cruel pair, when borrowing aid  
From geometric skill, they vainly strove  
By line, by plummet, and unfeeling sheers,  
To form with verdure what the builder form'd  
With stone. Egregious madness! yet pursued  
With pains unwearied, with expense unsum'd,  
And science doating. Hence the sideling walls  
Of shaven yew; the holly's prickly arms  
Trim'd into high arcades; the tonsile box  
Wove, in mosaic mode of many a curl,  
Around the figur'd carpet of the lawn.

Hence too deformities of harder cure :  
 The terrace mound uplifted ; the long line  
 Deep delv'd of flat canal ; and all that toil,  
 Misled by tasteless fashion, could achieve,  
 To mar fair Nature's lineaments divine.

MASON.

Addison and Pope employed the keenest satire in ridiculing the right angles and disfiguring shears of the gardeners of their day—while the one was forming a rural garden at Bilton, near Rugby, and the other a picturesque plantation at his retirement at Twickenham. These were ably supported by Kent, who both as a painter and architect, did more to reform the taste of the time than any other individual : he laid out the grounds of Claremont and Esher about 1730. We would refer the reader to the remarks made by Mr. Horace Walpole in his ingenious essay on modern gardening, if he would wish to trace the gradual change, and form a just idea of the reformation which Kent effected. From the various passages he has quoted from Milton, he endeavours to show that our divine bard had the justest and most perfect idea of this beautiful art full half a century before Kent. We ought not to pass unnoticed, as belonging to this period, Abraham Cowley, the poet, physician, and author of *The Four Books of Plants*. As a botanist or gardener he would merit little attention ; but his assistance to both, in winning the notice of the literary, and advancing the progress of a genuine taste for natural beauty, deserves naming.

These were successively followed as landscape gardeners by Wright, Brown, Holland, Repton, and Price, and a host of practical gardeners, whose scientific acquirements have been brought to bear upon botanical arrangements, which the master mind of Linnæus reduced to order in 1737, and the structure and uses of the several parts of plants which have in a great measure dissipated the ignorance in which vegetable physiology was enveloped. To the labourers in another portion of the field of science we are indebted for the most luminous researches and discoveries as to the food of plants, the influence of air, heat, light, soils, &c., the principles of vegetable life, and the importance of the leaves as to breathing and nourishment. Vegetable chemistry stands associated therefore with the names of Ingenhousz, Van Helmont, Priestley, Saussure, and others, whose exertions contributed a gigantic aid to the advancement of the science. The royal gardens at Kew were laid out in 1760, by Sir. W. Chamber, under the direction of the Princess Dowager of Wales, mother of George III. : these have subsequently become one of the most celebrated botanical institutions in the world.

Thus, at the close of the eighteenth century, a light of science, which had begun to beam upon Horticultural pursuits towards the close of the previous one, was concentrated into a powerful focus, and the present century was ushered in under the most cheering auspices, which the formation of the Horticultural Societies of London and Edinburgh have tended to foster and promote, so that we may now challenge any former period of our history, or that of any other country in every department of the science. The general diffusion of scientific information among our gardeners has mainly tended to produce this effect, for though it has not been marked by any extraordinary discovery, yet, whether we consider the style or practice of gardening at the present day we find it more generally understood, and more consistent with a chaste and classical taste as to order and beauty. Landscape gardening may indeed be said to have reached almost the acmé of perfection ; and as far as the practical parts of gardening are concerned we are almost justified in asserting that but little is left for after experience to improve, so that the gardener has now but to look for improvement to those sciences which may discover to him new modes of treatment, and guide him in the judicious application of his present practice, and which will be principally found in botany and chemistry. It is to botanical research we owe nearly all the flowers which in such rich variety adorn our gardens, and the varieties of fruits and culinary vegetables which supply our tables ; an enlightened practice and an intelligible language are the results of an acquaintance with it, and to chemical analysis may be referred all that we know of the food and functions of plants, of soils, manures, &c., and the most appropriate mode of cultivation and treatment of the different objects that come under the gardener's care. Lavoisier, one of the greatest chemists of his day, may be quoted as an example of what may be effected by practice and scientific knowledge combined.

The practice of gardening is fostered and encouraged in the present day to an extent hitherto unknown. Patronage is necessary to the progress of every art, and gardening is receiving its share of public attention. We have already spoken of the parent Horticultural Societies, which enrol among their members almost all the talent, nobility, and wealth of the United Kingdom—these are being subdivided and ramified throughout every principal place in the empire, local societies are springing up in every direction.

Such then has been the progressive improvement in this lovely and delightful art during the various periods of our history we have ra-

pidly travelled over, and such are the encouraging features it presents in the present day. It has been justly observed by Bacon that "it is the purest of human pleasures," that amid such scenes "the life flows pure, the heart more calmly beats."

Strange there should be found,  
Who, self-imprisoned in their proud saloons,  
Renounce the odours of the open field,  
For the unscented fictions of the loom;  
Who, satisfied with only pencilled scenes  
Prefer, to the performance of a god,  
Th' inferior wonders of artist's hand.  
Lovely, indeed, the mimic works of art,  
But nature's works far lovelier.

*Cowper.*

We have before observed among the advantages of this pursuit, that it tends to endear a man to his home, and here we are ready to exclaim with Kirke White—

"That hut is mine; that cottage half embower'd  
With modest jessamine, and that sweet spot  
Of garden-ground, where, ranged in neat array,  
Grew countless sweets, the wallflower and the pink,  
And the thick thyme-bush,—even that is mine;  
And the old mulberry that shades the court  
Has been my joy from very childhood up!"

With proportionate force it may be said also to attach him to his country, as those well know who having been long absent from their native land, on beholding again the fields spangled with "buttercups and daisies,"—"where the primrose sparkles through the hazel-hedge, and the violet peeps so modest-

ly;" or as they behold "the village elm, the well-known oak, or the unchanged yew, whose antiquity is equal to that of the church it shades" pour out the genuine effusions of their joy.

I know each lane, and every alley green,  
Dingle or bushy dell of this wild wood;  
And every bosky bourn from side to side,  
My daily walks and ancient neighbourhood.

*Comus.*

The plants or trees of our country recal it forcibly to our remembrance wherever we may meet them. We are told of a young Indian (Pontaveri, from Otaheite), who, in the midst of the splendour of Paris, regretting the simple beauty of his native island, sprang forward at the unexpected sight of a banana-tree in the Jardin des Plantes, embraced it, while his eyes were bathed with tears, and exclaiming with a voice of joy,—“Ah! tree of my country,” seemed, by a delightful illusion of sensibility, to imagine himself for a moment transported to the land which gave him birth.

There is a land, of every land the pride;  
Beloved by heav'n o'er all the world beside;  
Where brighter suns dispense serener light,  
And milder moons emparadise the night.  
A land of beauty, virtue, valour, truth,  
Time tutor'd age, and love exalted youth.

Where shall that land, that spot of earth be found?  
Art thou a man—a patriot—look around.  
O thou shalt find, how'er thy footsteps roam,  
That land thy country, and that spot thy home.  
MONTGOMERY'S *West Indies*.

## CALCUTTA GARDENING.

BY GEORGE W. JOHNSON, ESQ., FELLOW OF THE AGRA HORTICULTURAL SOCIETY OF INDIA, ETC.

GARDENING in India is yet in its infancy, and this immaturity extends from the mere process of turning over the soil, to the most difficult of all tasks undertaken by the cultivator of the land, making the plants of a cold, or even of a temperate climate flourish in the torrid atmosphere of the tropics. Every process of horticulture is there more imperfectly pursued than necessity commands, yet in all, there is so much of novelty, that a detail cannot fail of interesting and affording some hints to the English gardeners.

The most extensive horticultural establishment near Calcutta, is the Botanical Garden. This is situated about five miles from the city, on the opposite or western bank of the Hooghly. The usual mode of travelling to this most delightful retreat from the dust and intense temperature of metropolis of India, is in a beaulah. This description of native boat, has six or eight oarsmen, or rather paddlers, and the voyager is well sheltered from the heat by a well-ventilated cabin, which shades from the sun, whilst it admits the wind let it blow from whatever quarter it may chance. The manjee,

III.

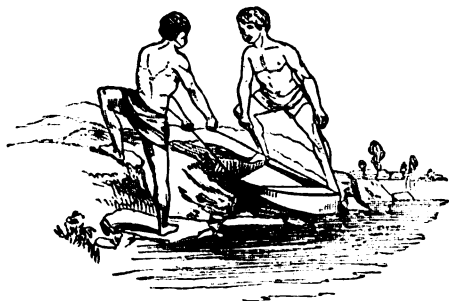
or coxswain, guides the invariably green-painted barque by the aid of a long stern-oar.

Both banks of the river, but especially the eastern, exhibit to the passing voyager a succession of palatial residences, and their large surrounding gardens. These consist of various arrangements of lawns, parterres, and shaded walks, the shelter of the latter being chiefly derived from the mangoe, lichee, and tamarind trees. These are round-headed, and contrast thus in form with the lofty cocoa-nut and talipot invariably associated with them, as much as they do their dense dark and glossy foliage, with the pale, lightly-waving leaves of those palms.

The approach to each garden from the river, is by a flight of steps, too often neglected, but, when duly kept in order, presenting a most agreeable and fitting appendage. In such a climate, where every animal and vegetable pore is exhaling at a high pressure, every facility for the supply of water is suitable and grateful even to look upon, and for the successful cultivation of the garden in India, the

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command of such, almost to an unlimited extent, is indispensably necessary. To secure this to raise the water from the river to the requisite elevation, many are the contrivances employed to reduce the necessary expenditure of labour. The most common is a simple scoop formed of a palm leaf mat, and swung between two men, who alternately fill it with water and deliver its contents into a basin above them, whence it is removed by others by a similar process, and this is repeated until it has been raised to the elevation required.



Another very common process is that of the wheel with buckets round its periphery, moved like the tread wheels of our prisons, by the weight of those employed to step upon its paddles. But where the water is at a considerable depth from the surface to which it has to be raised, a bucket suspended by a long rope at one extremity of a lever of great length is the most customary mode of obtaining it. These simple modes beat, and always must beat, in point of economy, the best hydraulic machines in a country where the most able bodied labourer can be hired for threepence per day.

The same simplicity characterizes the implements of the *mallees*, or Indian gardeners. It is literally a fact that they have but three tools for tilling the soil, the spade being totally unknown to them. Its place is supplied by their *kodali*, which is a heavy hoe, with a short handle, and exceeding in size and weight of



blade any known to the British horticulturist. Crouched, with their hams resting upon the calves of their legs, it would be matter for surprise to every British gardener how much land, and how effectually, they turn over in the course of a day. That it is effectual, is demonstrated by the heavy crops of garden produce they obtain, and which I shall have occasion to notice hereafter. The same tool serves for a shovel to fill the baskets employed for carrying manure on to the ground, the wheelbarrow being unknown, as well as to clear the surface from weeds. Performing as the kodali thus does the offices of our spade, shovel, and hoe, it is extraordinary that the natives should in all those instances wield it so adroitly.

The two other tools employed by the Hindoo gardeners, are the *nuranee*, a small slightly curved spud for eradicating weeds, and a rake little differing from that used by our cultivators. Passing from the *mallee's* tools to the operations which have chiefly to engage his attention, the first which strikes the European visitant's attention, is the system of *retardation* pursued. The forcing department in India, is the adoption of means to produce a temperature so low that peas, kidney beans, lettuces, and other products of a cold climate may be obtained in perfection. The temperature is so high on the Calcutta shores of the Ganges, that the transition from the bud to the blossom, and from the blossom to the fruit matured are the work of a few days, and this cannot be checked to any beneficial extent by any means at present known, during the hottest periods of the year, extending from the beginning of April to the close of October. The gardener has then to contend against a meridian temperature ranging between 90° and 120° in the sunshine. During the other months of the twelve, commencing with November, and concluding with March, the temperature is much lower, though it still averages more than 80° at noon, during that period.

To retard the rapid advance of plants to maturity, the mallees form the beds on which they are grown with a considerable inclination towards the north. This is intersected, at right angles to the slope, with little canals or trenches, for retaining a constant and abundant supply of water, and the rows of plants, ranged east and west, are shaded by mat fences kept constantly sprinkled with water during the daytime. The consequent evaporation materially reduces the temperature; and in one instance, I saw the temperature of the soil itself kept much below that of the atmosphere, by having it covered with refuse grass, and these kept moist with water in the same way as the mat fences.

I never had an opportunity of ascertaining with precision, the amount of the reduction of temperature thus produced, but that it is very considerable is attested by the fact that the natives so ingeniously conduct evaporation that they actually produce ice by its agency. This, which was effected formerly for the purpose of wine cooling, is now superseded by ice imported from North America, and the Hindoo's discrimination between the two, as "man's ice," and "God's ice," is not unworthy of record.

Despite every effort to reduce the fervid temperature of the climate, it is still too high too permit the plants of the colder zones ripening their seeds so as to produce an offspring undegenerated. This renders it necessary for the gardens of India to have a supply of seeds from more temperate regions. The best garden seeds or rather those in best condition, reach Calcutta from the Australian provinces, especially from Sidney. Next in fertility are those from the Cape of Good Hope. From England, if the seed is conveyed by the overland route, disappointment rarely occurs, but if brought by ship they too generally fail. This seems to arise from their being packed in too large quantities, thus causing a heating which destroys their germinating powers. As some London seedsmen are in the habit of shipping large consignments to India, it may be well for them to know that the most successful plan is to pack the seeds, however large the quantity, in numerous small paper bags, to put these lightly into small casks, not larger than firkins, and to have these perforated with holes, *kept between decks*. They are thus constantly as cool and as dry as possible, the perforations allowing the air to circulate through them, and the steam generated to escape. If they are placed in the *hold* of the ship, its damp and high temperature is certain of producing a sufficient progress towards germination, which being checked destroys vitality before the seeds reach India.

If the visitor turns his steps to the kitchen garden of the Indian residents, usually the furthest from the mansion, and hid from view by plantations, he will recognize most of its tenants usual in England. The same varieties of pea from the early Warwick up to the Knights Marrow, with the addition of one from America, the Early Washington, and one or two of native origin. The last are very inferior.

Of broad beans the principal English varieties are *sown*, but so rarely are they productive at Calcutta, that I might almost say they are never reaped. The substitutes are the Black Bean, or *Pois Noir*, of the Mauritius, the Assam Bean, and two or three varieties of the

Dolichos, of which the most commonly cultivated is called *Makun Seem* by the natives. The potato never attains perfection in the vicinity of Calcutta, the temperature being too high, and the subsoil too wet. It is cultivated largely, however, at Chira Poojee and other hill districts, and is brought thence in abundance for the supply of the city. Potatoes, usually are sold there for an anna per seer, which is equivalent to our two pounds for three halfpence. The parsnip never attains the same sweetness and tenderness that it does in Europe, but the carrot I have seen of a size and excellence unsurpassable. Besides the radishes known in England, there is one a native of Hindostan, which grows to a large size, but is too coarse to please a British palate. In addition to these is that truly delicious vegetable the sweet potato, and the still more wholesome yam. Besides the European spinaches there are also the green spinach of Nepal; and the Hindoos *Poi Sag*, the leaves and young shoots of which are excellent when boiled. Onions are the most favourite vegetable with the natives, it is the universal condiment—it is eaten with all their meals, and may be smelt in every direction, and during every hour of the twenty-four. That most generally cultivated is small strong and red, but the Patna and the Bombay are very large and mild. Asparagus is a native of India, and much cultivated, but it is usually bitter and inferior in every desirable quality to the English varieties. Artichokes, lettuces, celery, cresses, cucumbers, gourds, tomatos, the egg plant, known in India as the Brinjal, capsicums and pot-herbs, are also found in almost every garden.

Having noticed the chief kitchen garden products of Calcutta, and the customary routine of their cultivation, I will next offer a few remarks upon their principal means of sustaining their crops and fertilizing their soils—IRRIGATION.

In no district of the world is this so generally or so extensively pursued as in Hindostan. Prejudiced by the dogmas of their religion against meddling with the dung of any creature but that of the ox, and using this chiefly for fuel; totally ignorant of the use of mineral manures; equally destitute of information, relative to the admixture of soils, and with but scanty means of obtaining vegetable refuse; their crops would be unproductive, indeed if it were not for the fattening influences of irrigation. Like the prophet of old, who, when describing symbolically a righteous man, and wishing to magnify his being fertile in all goodness, says he, "as a tree planted by the water shall not see when heat cometh, but its leaf shall be green, and shall not be careful in

the year of drought, neither shall cease from yielding fruit"—so the Hindoo is careful to have all his cultivated plants within the influence of an unlimited supply of water. To obtain it to particular districts no expense has been considered too great either of money, or time, or labour, and many magnificent structures in the form of canals and tanks are existing, formed by private individuals as well as by governments, which are now diffusing wealth and fertility over the districts in their vicinity.

Some of these are of vast extent. There is a tank in the Madras Presidency covering a surface of many square miles; formed by simply preventing the egress of the mountain streams from a valley. It is supplied with a regulated system of sluices to permit the water being supplied to the cultivated lands, and is of an antiquity that knows no date.

To some of their crops, as rice, they apply the irrigating waters in sufficient abundance to maintain it constantly at a depth of three or four inches over the entire surface of the field, but to other crops, as those of their gardens, they have a very accurate arrangement of little canals passing between every two rows, and well proportioned to their size, surface of leaf, and consequent transpiratory powers.

In the fruit garden there are many varieties of species cultivated in England and some which are not known to our gardeners. Thus of the peach, though the variety most usually cultivated is the China flat peach, first made known in England, I believe, by Mr. Livingstone, yet there is another round, and with a remarkably small stone, which is very delicious, and would be a valuable addition to our list.

The apricot, almond, and cherry, are scarcely known in the vicinity of Calcutta, but they succeed admirably in the more temperate or hill districts. Of plums there are none of the European sorts, but there are two very inferior varieties, called by the natives the *burra bair* and *chota bair*, the large and little plum. The mango, I have reason to think, would succeed in England with no other care or shelter than that bestowed upon peaches against open walls, and I should very much like to see the experiment tried. The fruit of the good varieties are delicious.

The apple and pear exist with difficulty near Calcutta, and not more than three instances are known of either of them bearing fruit.

The *Loquat* is now known in England to those who have conservatories. Its fruit grows in clusters and is oval, yellow, and smooth skinned. It is of the same genus as the medlar, and its fruit, like that, gratefully sub-acid, though not requiring to be kept until decayed. It is easily propagated by layers, and there is one

practice essential to its full productiveness, not generally known, namely, that so soon as the blossoms open, a trench should be made at a short distance (2 feet) from the stem, and filled daily with water until the fruit commences ripening. The *plantain*, the commonest fruit of India, is in season throughout the year. In the hot-houses of Sion House and elsewhere it has been ripened in this country, but the plants cultivated are not the true *Banana* variety, known at Calcutta as the *China Chum-pale*, and consequently the produce is insipid, and only fit to boil as a culinary vegetable. The fruit of the best variety is now dried like the fig at Calcutta, and exported to the London confectioners. There are only two hints that I would give to those who cultivate them here as stove plants, viz., to keep them abundantly supplied with water whilst in blossom, and to break away the old stem so soon as its raceme of fruit has been cut away. The fruit should be cut while yet green and hung up to ripen, which is announced by its not only becoming quite yellow but by a few black spots or blotches appearing on the outer skin.

The *Dacca* or *yellow-fleshed Pine Apples* of Calcutta are most delicious fruit. They are sold at about three halfpence each, and are commonly used as a substitute for apples in tarts, puddings, sauce, &c. I have known them weighing more than 7 lbs. without their crowns.

This common *Guava* has a harsh perfume, very different from the flavour of the jelly it is employed to make. The *Strawberry Guava* has been introduced from the West Indies to Calcutta, and has a far more excellent flavour. The best manure for them and for the plantain is the mud from the bottom of an old ditch or pond.

There are three species of the *custard apple*, the sweet sop, the sour sop, and the bullock's heart—all having the peculiarity of delighting in soils containing common salt; indeed the last named grows wild and most luxuriantly in the vicinity of the salt lakes of India. Its fruit is the coarsest flavoured; that of the other two is filled with a gelatinous mass not unlike an insipid custard.

The *Rose Apple* is a small, oval, hollow, fruit, its cavity containing a much smaller round stone. Its flesh resembles that of the common hip, flavoured with a perfume of roses. The *Lichee* is a native of northern China and Japan, and therefore would probably succeed in the southern districts of England. Its exterior is not unlike that of a very large red mulberry. Beneath the skin is a very juicy gratefully sub-acid flesh, enclosing a large oval seed. It is easily propagated by layers or grafting, and grows fruitfully in a moist

rich soil. The lower shoots should be carefully pruned away as it is apt to grow crooked, and it should not be allowed to bear fruit until it is six years old. Whilst in blossom, and until the fruit is full sized, it should be well supplied with water.

There are many other fruit trees and flowering shrubs which might have a passing comment if they were either capable of being transplanted to our gardens or merited the endeavour to acclimatize them, but I will leave them and at once proceed to notice the Calcutta Botanic Garden.

Never shall I cease to remember the delight I felt during my first visit to that luxurious domain of all that is rare and splendid in the vegetable tribes of tropical climes. I landed upon the stone steps which conduct the visitor from the waters of the Ganges to the curator's house, and passed up under an over-arching trellis well embowered by creeping plants effectually excluding the sunshine, and mingled prominently among which plants were in abundance of the flowers of a gigantic specimen of that most poetical of flowers the night-blooming cereus. On either side the path were various species of the most sensitive plants, the mimosas, hedysarums, &c. Passing into the lower floor, the house (generally uninhabited) I found it stored with chests of Assam tea, a produce likely to become one of the most valuable exports of India; and descending the stairs met that most excellent man, Dr. Wallich, the present curator. We examined together his library, stored with a good collection of Botanical works, ancient as well as modern. We watched at their works the native artists copying the flowers as they blossom in the garden, and the pictures from whose pencils are accumulating thus annually to be deposited in the library of the East India Company.

So soon as the sun's decline permitted, we visited the garden. This was commenced in 1768 by Colonel Kyd, and has since that time gradually increased to its present size and importance. It then passed to the care of Dr. Roxburgh, who laboured there most successfully from 1793 to the date of his death, 1813. A small temple shelters an urn dedicated to his memory in one of his most favoured spots near the great banian tree; and Dr. Wallich has prepared a grave for himself, where his own remains, it is to be feared, will soon repose if he does not try before long the invigorating influence of a more northern climate. That banian tree to which I have alluded, gives the stranger a more forcible idea of the vastness of tropical vegetation than any other object. The trees of milder climes sink into insignificance when called to memory for the

sake of comparison. Its branches and their numerous sustaining self-united stems form of themselves a grove covering about an acre of ground. Not far from the banian is to be seen a specimen of the far-famed and much-fabled *Upas Tree*. That its sap is virulently poisonous admits of no doubt, but not to the extent once believed, when that in Java was the only one and that imperfectly known. So far from the very atmosphere around it being rendered pestiferous by the exhalations from its leaves, I have frequently plucked them and handled its stem. During this visit I saw for the first time that most rare and most elegant of trees the *Amberstia*. But two or at most three specimens are known to exist. No one who has not seen its mingled, graceful, pale-tinted foliage and long pendulous rosy flowers, can form even a proximate conception of its surpassing loveliness. Turning to the waters of the garden I saw floating on their surface the classic flower of the Eastern tales, the pink and white-petalled lotus. Around their margins were to be seen the pitcher plant, with its strange appendages of closed water receptacles attached to each leaf. Palms of various description, and among them that friend in the desert which spouts forth water when wounded with a knife. Passing to other divisions of the garden, we visited the potting houses, where annually thousands of specimens of rare and useful plants are prepared and dispatched to every quarter of the globe. Tea plants, superior varieties of the sugar cane, plants of madder (*Calotropis procera*), a substitute for ipecacuanha (*Menettia cordifolia*), a substitute for the squill (*Crinum Asiaticum toxicarum*), quassia and guaicum plants, a substitute for sarsaparilla (*Hemidesmus Indicus*), fustic and a dye-wood abounding in tannin (*Cæsalpina coriaria*). I cannot close this slight notice of the Botanic Garden at Calcutta without a further tribute to the merit of its curator, Dr. Wallich. He is by birth a Dane, and was a physician at Chandernagore, the chief Indian colony of his native country; but the late Dr. Carey introduced him to the notice of our government, and how well his scientific attainments merited such notice, is demonstrated by his published works, and by the fifty societies which, unsolicited, have enrolled him among their associates. Parallel to his botanical knowledge is the urbanity and liberality with which he meets the wishes not of his friends only, but of all who ask from him either the gratification of their curiosity or an addition to their botanical stores.

#### IMPROVEMENTS OF GARDENS AND PARKS.

If a landscape gardener was called in to set

a nobleman's domain to rights, he would in all probability find very little of it that accorded with his taste, and turn the whole concern first into a waste, and lay it out according to his own notion of propriety, or, as he might think according to the prevailing fashion or taste. He might, and probably would, make a very handsome place of it, lay out every thing after the fashion of the day and plant it with choice trees and shrubs, quite worthy of the science and pleasing to the owner, but the expense would be enormous, probably large enough to cure the proprietor of any future desire for garden making. I should be, perhaps, one of the most earnest admirers of the taste displayed, and rejoice that another garden were added to the at present very small number that deserve the name of a noble establishment. I have been fortunate enough to meet in my little experience with places capable of vast improvement without vast expense, and to have pleased the owner by a few judicious alterations, which have given neglected premises quite another appearance. I have scarcely met with a gentleman's seat of any consideration that could not be most wonderfully improved with a comparatively small outlay, it is in such undertaking that I have been most fortunate; I know that professed landscape gardeners would afterwards find many faults, they might always discover something, which according to their notions would be wrong, and there are those who have said I know very little about the matter, because something has been left undone that ought to have been done; but, they have not known that one hundred pounds have been expended, when to do the thing properly a thousand would have been insufficient. In most cases, the owners would no more think of laying out the necessary sum than they would have set fire to their mansion, and it seems to me quite a folly to lay out nothing merely because a large sum could be expended to advantage, in other words, it seems near a kin to insanity to refuse any improvement merely because the sum would not command perfection. What for instance should prevent the owner of a property expending fifty or a hundred pounds to make an estate look five hundred or a thousand pounds better? Yet I will venture to say that such a sum laid out at the very entrance of many an estate worth thousands of pounds, would so improve the appearance, that the owner could hardly know it again. In some instances the cutting down of half a dozen trees, the planting of a few clumps, and specimens, the slightly turning of a road, or the judicious alteration of a piece of water, would work almost a wonder in the apparent

value of an estate. But it may be objected that the entrance is of no consequence, and that an owner would rather lay out all his intended expense in improving the grounds close to the mansion. There is something selfish in this, because in the external appearance, every passer by is interested, whereas in what is done out of the public view, those only who visit or inhabit the house are gratified; nevertheless, the same argument which applies to the view from the exterior is equally applicable to the home portion, judicious alterations which cost a trifle in comparison to what might be well expended will do much, and I prefer at all times recommending these moderate outlays. If a vast improvement can be made for a moderate expense, the satisfaction is so much the greater, that an owner is encouraged in his love of gardening, whereas where the larger outlay is recommended, he is often either deterred from attempting any thing, or is so thoroughly dissatisfied as to condemn the gardening part of his establishment altogether. I wish, therefore, those who profess landscape gardening would keep their minds fixed upon the desirableness of not recommending too much, and of more without the fullest assurance of satisfaction being given, never attempting too much. I have several times been employed to form gardens, but much more frequently to alter and improve gardens, and the grounds adjoining where the estimates of others had completely alarmed the proprietors, and I will venture to say that in no one instance has the cost exceeded the wishes of the employer, I should not in any of these cases of mere attraction like to have it said that the place was laid out by me, because there have been features already existing which I should not have originated, and which I would gladly have got rid of, but which ordinary observers could hardly notice disparagingly, although gardeners and persons of refined taste on gardening matters, might find fault with when they begin to criticize the whole as a work of modern date. I am quite willing therefore to make the best of any place at the smallest possible cost, satisfied with having accomplished a great improvement upon what already existed without approving any the more of features I should never have given them, but which nevertheless I may not think worth the cost of disturbing, and I believe that if the owners of fine properties were made thoroughly acquainted with the great improvements, they might make with little cost, very few would allow them to remain as they are another season.

G. G.



THE CYPRESS TREE OF ARABIA, TURKEY,  
AND GREECE.

THIS highly-valued and favourite tree is commonly called *Chennâ*, or *Kennâ*, by the Arabs and Turks; but, its true Arabic name is *El-hannâ*, or *Alhanna*; whence, its colouring matter for the toilet has been long known in some parts of Europe, as *Henna*. In Hebrew it is called *Copher*, and in Greek *Kupros*: the modern Greeks, however, know it under the denomination of *Kenna*.

It rises to the height of the Pomegranate tree; and, as its external appearance, both at the thickest part of the trunk, and on the branches, is a mixture of white, green, and purple, the interior is yellowish. The leaves, which grow opposite to each other, never drop off in winter: they are shaped like those of the Myrtle, but are smaller, much thinner, and not so green. If boiled in water, either after being fresh gathered, or in a dry state, they communicate to it a beautiful orange colour: with this liquor Eastern ladies dye their nails, the palms of their hands, their hair, and sometimes their teeth.

The flowers proceed from the ends of the branches, which are exceedingly slender. Before they blow they appear like so many red and green balls, each about the size of a pin's head. These all burst forth, almost all at the same time, and hang in most beautiful clusters, like large bunches of grapes turned upside downwards. The small flowers which compose these clusters, are shaped like the rose, and, when expanded, are little more in circumference than a small lentil. The leaves, which are placed one over the other, are crisped, and of a yellowish-white, or cream colour. Each flower is supported by a small strong calyx, divided into five indentations. The petals, which are of an oval figure, smooth, and pointed at the extremities, are, likewise five in number, and from the centre of them arise eight slender stamina of the same height, disposed in pairs, and bearing on their tops small round antheræ. The capsule in the centre of the flower, which is round, is furnished with a strong pistil, having above it a stigma, with a blunt round point. When it attains to maturity this capsule becomes a globular fruit, something like a coriander seed; and, when perfectly ripe, it assumes a violet colour, shaded with black. Each of these berries contain only one cell, which is filled with small black seeds.

The Cypress begins to flower in August, and the branches continue, in turn, to send out blossoms till the end of Autumn. The length of a beautiful bunch of these flowers is about six inches; and the circumference, in

the largest part, about nine. An oil is distilled from them in the Levant, which the Turks and Greeks deem to be equal in quality to the balsam of Arabia. The Abbé Mariti observed, that in the island of Cyprus and elsewhere, these trees are kept in vases, whilst young; and that, when they attain the size of about three or four feet, they are transplanted into the garden ground. Though the regions of the East are their natural soil, they still require great care and attention. In summer they delight in the shade, but in winter they must be exposed to the sun's rays: in both seasons it is necessary to water them frequently. In winter, a mixture of horse-dung with that of cattle, is placed around the stems, to a considerable height, to preserve them from the cold.

The Cypress tree is very liable to be infested with small ants, and other little insects, which climb up their trunks, and often cause them to decay. The Arabs and Greeks daub over the stem, from the root up to the first branches, with tar or bitumen, which secures them from these destructive vermin.

The Cypress was held in great esteem by the ancient Jews, as well as by other Oriental nations. According to the Vulgate Bible, we find particular mention of it in the *Song of Solomon*, chap. i. v. 14, in these words:—“*Botrus Cypri, dilectus meus, mitri, in vineis En-gaddi.*” This has been erroneously translated in our bible, as follows:—“My beloved is unto me, as a cluster of *Camphire* in the vineyards of En-gedi:”—but, in reality, the spouse here compares her beloved to the clusters of flowers growing on the *Cypress*, as being the most rare and odoriferous tree in all Palestine. The passage ought to have been, “*My beloved is unto me as a cluster of Cypress flowers, blooming in the GARDENS of En-gaddi.*” Some persons have supposed that *Botrus Cypri*, means *Grapes of the Island of Cyprus*, or wine made from them and brought to En-gaddi, from the word *vineis* being used;—but we know that *vineyard* being often held synonymous with *garden*, St. Jerome made use of the word *vineis* in his vulgate translation; because the gardens of the East usually abounded with that grape-vine. Indeed, all the learned commentators allow, that the Cypress of Solomon's Song must have been a tree of great value, and producing flowers of the most agreeable perfume. *Copher*, or *Gopher* wood, was well known to the Hebrews, and is frequently spoken of in the Bible, as a material for fine cabinet work, some parts of the Temple, and of the Ark of the Covenant, having been constructed of it: it is not surprising that the timber of so odoriferous a tree as the Cypress should be used for the most select and valuable purposes.

The Cypress is greatly esteemed by the Arabs, the Turks, and the Greeks, who consider that they pay a very high compliment to a stranger, when they present him with a branch of its flowers. To Europeans, the smell of them, which greatly resembles musk, is rather too powerful, until they have accustomed themselves to strong odours, in which the people of the East delight, without experiencing the smallest bad effect from them. Indeed a taste for strong odours seems to be very ancient in the East, having been handed down without any interruption, from the caprice of fashion.

#### ON THE PLANTING, TRAINING, AND GENERAL MANAGEMENT OF THE FINER KINDS OF WALL PEAR-TREES.

BY JOHN MACDONALD, RICCARTON.

I OBSERVE that in the London Horticultural Society's third edition of their Fruit Catalogue, just published, there is a decrease of about two hundred from the number of kinds of pears deemed worthy of enumeration when the preceding edition of that catalogue was published about ten years ago.

This, at first sight, may appear strange, especially when it is taken into consideration that some additions have actually been made to our stock of that fruit during the period in question.

But whoever is in any degree acquainted with horticulture, or a lover of its pleasing pursuits, cannot but have observed the vast, though progressive, and still progressing, improvements that have taken place in the science and practice of horticulture during that period, and cannot fail to observe two sufficient causes for the decrease.

The first of which undoubtedly is, that many pears enumerated as worthy in the former editions, because received with specious, though, perhaps, not sufficiently well-tested, characters have, upon subsequent culture, proved worthless or indifferent. The second, and perhaps principal one is, that the standard of excellence in the Pear has been altered and raised of late years, and that to such a degree indeed, that but comparatively few of those Pears deemed good twenty years ago, are now considered worthy of cultivation.

There are some Pears in cultivation now that are deemed to be of first-rate excellence, and others are cultivated or condemned much in accordance with the degree of comparison in which they stand to these now deemed first-rate fruits.

But excellence in Pears is not permanent, and neither altogether is indifferent or depre-

ciating qualities. Many an anxious, enthusiastic, but disappointed horticulturist knows the truth of the former part of this sentence; and there are those who could bring proofs confirmatory of the latter; because, independent of the differences of seasons and situations, it is now pretty generally acknowledged that soil, manner of planting, suitableness of stock, proper choice of scion, mode of training, and summer culture, each and all influence, in very material degree, the product and quality of the new Pears, and of fruits in general indeed.

If such be the case, and I believe the thinking and intelligent horticulturist will agree with me that it is, it of necessity and obviously follows then, that it must be the duty of every cultivator to acquaint himself with the circumstances that influence the well-doing of his fruit; and if he be a well-wisher to horticulture, or an enthusiast in its practice, he will make no secret of success when he secures it.

It is more with a wish and hope to stimulate others, than with a vanity that I have myself anything of consequence to communicate, that I venture thus to scrawl a sketch of what appears to me to be the best manner of cultivating the Pear in Scotland, where there are many gardens destitute alike of good Pears and good Pear-trees, but in which the latter had once been, and where both might be. I say "where the latter had once been," because it is evident that the unproductive and often unsightly trees that clothe so many garden walls had once been *young* and susceptible of well-doing.

This naturally raised the question, How have these been mismanaged, and how may the like occurrence be avoided in future? An answer to the former of these questions will serve for both. The mismanagement has in the generality of cases been manifold. First and most prevalent is the error of planting trees deep in rich soil, and then digging that soil deeply, and manuring it heavily ever after, for the purpose of raising heavy and scourging crops of culinary vegetables on space where a spade ought not to pierce. Thus doing to the trees the three-fold injury of feeding them with too rich and unsuitable food, keeping their roots down deep beyond the sunheat's influence to warm them to healthy action, or to decompose the crudities that are regularly thrust upon them, and at length forcing their roots down into the ungenial subsoil; while to proceed rationally, these trees ought at first to have been planted shallow—that is, to have their roots stretched out horizontally, at not a greater depth than six inches below the surface, in suitable soil, that ought never after to be cropped nor dug within a distance of twelve or

sixteen feet from the bole of the tree ; nor ever trod upon while in a saturated state, but always kept free and porous for the free extension of the roots, and for the free admission of sun-heat and air. In a ring form around the bole of the tree there ought always to be a quantity of well-decomposed tree leaves, intermixed with sand—if in a slightly elevated or mound form so much the better—for the purpose of always having a good healthy system of roots emanating as near home as possible. Then the circumference around the tree beyond such ring can be kept mulched and moist at pleasure, during the growing season, and bare to the sun's influence, or protected from excessive moistness, as circumstances might require in the ripening season.

If the prevalent manner of planting has been wrong, and productive of evil and vexation, the manner of training and pruning—wall-trees especially—has scarcely been less so. Not that there are not many beautiful and some good modes of training, promulgated by writers upon horticulture. The mischievous errors have occurred in putting these modes into practice.

Utility has too often been sacrificed to mere appearances, or lost sight of altogether in the eager endeavour to ensure neatness, or what is supposed to be such. How often may garden-walls be seen covered with neatly-trained trees—supposed neat I should perhaps say—having such a quantity of neatly laid-in branches retained, that these branches can scarcely be as many inches apart as they properly ought to be feet, thereby converting the wall into an hedge in appearance, and into a mere skreen of shelter or utility. While if the branches had only been laid in at such distances apart as to allow the sunbeams to strike against and warm the wall, the tree and fruit would, in addition to the heat of sunshine during the day, have the useful addition of radiated heat from the warmed wall, for long after the sun had ceased to shine. Thus in some measure the tender pears would have, if not a lengthened summer and autumn, a warmer than our Scottish climate would naturally yield, and the walls would serve all their possible and legitimate purposes.

It must not be inferred from this, that I am an enemy to proper neatness : no ; so far from that being the case, I firmly believe that complete symmetry of form and habits of productiveness of fruit of the best quality, may always exist together. But before that can be the case we must not only change our system of winter training, so far as never to lay in branches at a closer distance than one foot apart at nearest. We must also alter our mode of summer pruning—we must make that,

if not less artificial, a little more imitative of Nature's own doings in its ultimate tendency.

It has, or may have been, observed by every cultivator of fruits, that woody plants in general seldom bear much fruit, or of good quality, so long as they continue to produce much wood or luxuriant annual shoots. That on the contrary, as soon as a tree ceases to produce much wood, it will, in direct ratio, commence to bear fruit abundantly, and will so continue to do, until disease, effects of accidents, a return to redundant wood-bearing habits, or old age puts an end to its well-doing or existence.

Such seems to be a rule with nature. Why may not cultivators imitate it in their artificial practice, since it seems easy of imitation. All that is requisite to be done is to look over the trees often during the growing season, and to nip out the tip of every shoot—not required to be laid in at full length—soon as it has made three, four, or five leaves. This gradual pruning being regularly maintained, would effectually check over-luxuriance ; would be productive of no such paralyzing checks to the trees, as they now experience from summer pruning being done all at once ; and useful buds would not be so apt to start into premature growth.

Another requisite, important and deserving the cultivator's best attention, is a proper choice of stock, suitable to his given variety of fruit—this is a consideration of vast importance, but greatly overlooked by cultivators, many, if not all of whom, confess their belief that trees require a season of rest, that some trees naturally go to rest sooner than others, that without its proper rest no tree will long continue to do well. Yet graft promiscuously together the earliest varieties and the latest on the same tree, a practice nearly of a piece with a command to a wearied man, to sleep with one eye, and keep watch with the other.

There are more "Falacies of the Faculty" remaining yet to be referred to, but as I have already been more prolix than I intended at commencement, I shall conclude this with an extract from Dr. Lindley's writings, promising at the same time, that though I can offer no opinion on that extract, I yet fully believe that a diseased scion, or one in which the rudiments of disease exists, can never be a longlived nor properly healthy tree.

Dr. Lindley, in leading article in *Gardener's Chronicle* of May 15th, 1841, says, "It is also certain that the quality of a stock is affected in certain cases at least by the scion. There is an experiment that illustrates this :—Some years ago, Mr. William Anderson of the Physic Gardens, Chelsea, budded the variegated white jasmine upon one branch of a fine plant of the revolute jasmine, the leaves of which were

green. The bud adhered to the bark of its stock, but never pushed. The succeeding year a slight appearance of variegation came upon the leaves of the revolute jasmine. The next year a workman cut the branch which had been budded; nevertheless the variegation in the remainder of the part continued to increase, and at the present time the leaves and branches are all variegated."

I have learned since the above paper on the culture of the Pear was read before the meeting in the Horticultural Society's New Hall, that some of the ideas contained in that article are deemed too theoretical by some worthy members of the Horticultural world—members whose opinions must, and deservedly too, be of great weight, and to which I would willingly bow, were it not that to do so would be equivalent to confessing that I had put forth my ideas hastily and inconsiderately, and that now I had no confidence in them. Besides, I have some hopes—faint enough, I confess—that if I am allowed to explain these ideas more fully, what I would have done before, had not the article been already too long. I may say something to—I shall not say remove, but to—mitigate in some degree the force of these opinions that are at present more favourable to my views.

I may not be aware of all the ideas objected to in my article; but one or two I have heard, and I hasten thus to explain. I have stated, in that article, that fruit borders ought not to be cropped. It is said in opposition to this requirement, that as good fruit has been gathered from trees growing in borders [that were constantly cropped, as from trees growing in borders that were not cropped. It is not because of the robbery committed by the roots of culinary vegetables that I object to their growth in borders so much, as because that digging the border must of necessity confine the roots deep down, beyond the proper influence of heat and air, without which the saccharine matter will not become well developed in any fruit.

Then it is objected to me, that my statement, that stock and scions affect each other is purely theoretical, and that the illustration I have employed is a bad one. This may be, I employed it—without putting much weight on it however—as being the experience of what I believed to be a respectable individual, and one having good opportunities of making observations: I certainly ought, instead, to have endeavoured to reason the idea as I shall briefly now endeavour to do; and in the first place, I may state, what will of course be readily conceded to me—that a Pear is composed of certain component elements. That

if these were always present in only one certain proportion, there would of course be only one variety of that fruit. But that, when these become varied in proportion, they of course enter into as varied chemical compounds, forming according to the predominance of one element or another, sweet or sour fruits—thus in short forming varieties of fruit. In the second place I may state—what will I dare say be also readily ceded to me; that different varieties of plants, often indeed different species of same genera will extract different substances from same soil; one will extract sweets on insipidities, while another will only extract sour on bitters. There may be a secondary cause that tends in some degree to produce this effect; but one main cause I humbly conceive to be the adaptation of the roots to imbibe food of a certain quality, when such may be found, and the adaptation of the leaves to elaborate, and the general system to benefit by such selection.

Now, if these be facts, will it not follow as a natural corollary, that when fruits of different qualities are grafted on one stock—the saccharine and the acidic, the melting and the crisp, it is surely not to be expected for them to do all well alike: their leaves and general tissue not being well adapted to receive benefit all alike from the same stock; and when the stock has no leaves of its own to elaborate sap, for it must of necessity suffer also from the imperfect elaboration.

I might bring forward more arguments in favour of these my views—such as constant tendency, supposed tendency. I ought perhaps to say, although for my own part I believe it to be the truth, that plants that have been cultivated away from nature, will have a constant tendency to revert back, and that adverse influences will of course accelerate that tendency. But, enough for the present, and now in conclusion let me say, that although these, my ideas may fail to extort conviction from any one, although they may be altogether erroneous, I yet, even in that case shall feel the satisfaction that it will be conceded to me, at least I hope it will; that I have not set forth my ideas thoughtlessly, nor without a real or supposed sound reason in them, and that my ideas are not borrowed from reading, but induced by observations.

If I be in error, I should like to be corrected, as I am about to put these ideas into practice.—JOHN M'DONALD, *Riccarton*.

#### CORRESPONDENCE, ON THE SUBJECT OF GUANO.

It has been remarked, and the remark most industriously circulated, that Guano stimu-

lates and exhausts the soil, and that its effects are so evanescent as to be imperceptible on second or successive crops: and some have even ventured to predict that a *second* year's experience would altogether expunge it from the list of manures. How far these persons have been well-meaning in their advice, or correct in their judgment, may be gathered from a perusal of the following letters, embodying, in some cases, the experience of even a *third* year's application.

Out of the numerous letters received on the results of Guano manure, not one has signified any apprehension of its impoverishing the soil; and only one has expressed a doubt of its efficacy on the after crops. That letter has been specially selected for insertion, that the doubt may be fairly estimated; and on reference to page 53, it will be found that Mr. McGeoch rather inclines to trace his misgiving to the lengthened early drought of the present season, and positively claims to suspend his judgment, for further experience.

Sir, the following are extracts:—"The only trial that I made of Guano was in 1842. I, like many others, being somewhat sceptical as to its powers in raising crops equal to those that were reported to be raised by it, and especially after a quantity which appeared to me so trifling, determined that trial alone should convince me of the fact. I accordingly ordered a small quantity of it, and made trial of it upon part of a field of turnips. The ground upon which it was applied, was a light soil, upon a hill bottom. The portion of the field upon which it was applied was considerably the worst part of it. The mode in which I applied it was as follows:—having first drilled the ground, I put in a very small quantity of dung, then covering that lightly with the plough, taking care to leave a small furrow on the top of the drill, into which the Guano was put, then having again covered it lightly, I put in the turnip in the usual way. The quantity of Guano applied was about 3 cwt. per acre. The crop on the part of the field to which the Guano was applied, was superior to that on the other part of the field, which was very heavily manured with the best farm-yard manure, at the rate of 60 square yards per acre; as soon as the braird appeared, it seemed healthier than that on the part of the field to which no Guano was applied, and all

along appeared so, notwithstanding the effects of the dry season, better than the other.—Having left a row for experiment, about the centre of the plot to which Guano was applied, without giving it any, it proved a complete failure, whilst that, on which the Guano was put, was a most luxuriant crop; and I am now fully convinced, that could it be got *pure and unadulterated*, it is one of the best manures that has yet been offered to the public, and promises ultimately to be of inestimable value to the agriculturist.—JOHN RUSSELL, of *Ashmark*.

SIR,—I am in receipt of your letter, dated 14th instant, wishing to know how I applied Guano, and what might be the result, and am happy in having it in my power to state that it has answered my most sanguine expectations as a manure. I made trial of as much as manured a Scotch acre in the spring of 1842, for turnips, at the rate of 4 cwt. to the acre; and, from the first time the plants made their appearance, they were by far healthier than those manured with common farm-yard dung, and, latterly I had by far the bulkiest crop. The method in which I applied it was by opening the drills, same as if I had been intending to put in common farm-dung; and before dropping the Guano, I harrowed the drills almost quite smooth; I then dropped it and covered it up. In the season following I sowed oats, and had a fair crop; and this season I had a crop of hay which was a most splendid crop, without any additional manure. I have no doubt of Guano as a most beneficial manure. That portion of my turnip-crop, manured with Guano this season, looks to promise a fair crop.—JOHN HARVEY, *Eastmains, Kilbirnie*.

SIR:—In answer to your request, I have given you, in the following table, the result of a trial made by me last year, with four different kinds of manure, in growing Swedish turnips. The manure was applied in the drills, without any moisture, and the turnips sown on the 20th May, 1843; where the *guano* was used they braided more rapidly, were sooner ready for the hoe, and kept ahead of the others to the 27th November, when they were lifted and carefully weighed. The soil of the field on which they were grown, is a dry, friable loam, and had been from time immemorial in grass until 1838.

Kinds and quantities of manures used per Scotch acre.	Price of manure per acre.	Weight of Turnips without roots or tops.	Weight of roots and tops.	Weight of Rotten turnips.	Weight of total produce per acre.
	<i>l. s.</i>	<i>Tons, cwt. lbs.</i>	<i>Tons, cwt. lbs.</i>	<i>Tons, cwt. lbs.</i>	<i>Tons, cwt. lbs.</i>
GUANO, 5 cwts. . .	2 15	29 17 13	6 12½ 11	1 13 17	38 2½ 13
Farm dung, 12 carts	3 12	25 7 8	6 15 6	2 12 13	34 14 27
Bones, 26½ bushels .	3 3	25 12½ 6	5 14 14	0 14 22	31 8½ 14
Rape-dust, 12 cwts. .	3 0	22 19½ 22	5 9 —	2 8½ 6	30 17½ —

On the same field where the turnips grew we sowed wheat on the 17th February, 1844, without manure of any kind: no difference was observed in the wheat till it came out in the ear. Where the dung was used it appeared a little taller and stronger in the straw than that with guano; but the *guano* is decidedly better than either rape-dust, or bones. In the autumn of 1843, a field that has been regularly in crop, the soil of which may be considered a good loam, resting on a very retentive sub-soil, composed of condensed sand and bluish clay, but thoroughly drained: after a crop of beans, in preparing the said field for wheat, we manured eight acres with good farm-dung, at the rate of ten cart-loads to the Scotch acre; other four acres were manured with *guano* at the rate of three cwt. per Scotch acre. On the 27th October the field was sown, but no difference appeared in the wheat till the first of summer, when the *guano* began to show itself by the healthy appearance, and more vigorous growth of the wheat, and still continues to promise a greater crop. Another field with a sandy soil, and sub-soil of sand and clay, after a crop of barley, was manured on the stubble with farm-dung, using twelve cart-loads per Scotch acre, and at the same time ploughed down; on the 24th April, 1844, planted with potatoes, which were manured in the drills three cwt. of *guano* to the Scotch acre. To try the *guano*'s fertilizing powers, three drills were planted without any. The potatoes were not long above the ground before they began to show the value of *guano* as a manure; the three drills in appearance are much inferior to the others, and have had no disadvantage to make them so, *but the want of guano*.—GEORGE GRIEVE, *Archerfield*.

SIR:—I applied *guano* in 1842, to turnips in drills, at the rate of three cwt. per Scots acre, on *hard dry land*, on *loam*, and *moss on a clay bottom*, and consider it answered the same end *on all the different kinds of land*. The turnips were good over all, but fully largest on the dry: I cannot state the weight per acre, as I had not an opportunity of ascertaining it—indeed it is seldom attended to here. The largest I observed measured twenty-nine inches in circumference. About half the crop was eaten off with sheep. The same season I applied it to a few drills of potatoes, but cannot state the exact rate per acre—it would be fully more than was applied to the turnips. The potatoes were carefully measured, and found to be at the rate of twenty-four bolls of eight cwt. per acre. The crop last year was a fair average—part barley and part oats. This season the rye-grass crop was not good, but whether owing to the early drought or the *Guano*, I cannot say,—even since the hay was

out, it does not seem to come away at all equal to a field cut last year, laid down with bones, at about thirty-five bushels per acre. Last year, (1843,) I used *guano* to the whole of my turnips, at about four cwt. per acre; the field was mostly a dry soil—the crop good, but not equal to the preceding year. There is a crop of barley on the most of it, which is a fair one, about an average, but whether it was hurt by the drought in the spring or not, I cannot say. This season, I have applied half bones, half *guano*, say about fourteen bushels of the former, and two and a half to three cwt. of the latter, the turnips, though regularly planted, are not so far advanced as I would expect. I have no hesitation in saying, that *guano* will raise a good crop of turnips, but I much question its advantages for the after-crops, although I will not condemn it until I see further results. For grass after turnips, I certainly prefer bones, but will give it a fair trial. I never used it to any extent on grass or crop-land, so on that head I make no remarks. I have given you a full and candid account of all the experience I have had with *guano*—I am fully of opinion it acts quickly as a manure on any plants. I will be happy to hear of the experience of some others.—ALEXANDER M'GEOCH, *Craus*.

SIR,—It is now the *third* season that I have tried *guano* for manure, principally for turnips. There is no manure that I have tried, has so much exceeded my expectations. I have raised turnips with it applied at the rate of four or five cwt. per Scotch acre, fully equal to those which got an ordinary dressing of farm-yard manure, say from thirty to forty square yards. From its comparatively small bulk, I had not much confidence in its effects, until I have now tried it a *third time*, and find it to produce a good appearance of a crop. From an experiment I made last summer, I think it will be likewise found valuable as a top-dressing to hay or grass. Sown upon it in spring, it should be mixed with sand or fine mould, or some such mixture, about equal quantities of each. I have not tried it much for potatoes, but it has been tried for that crop likewise by some of my neighbours, and found a valuable assistant in raising that crop. For turnips we sow it in the bottom of drills, made shallow for the purpose, and cover it with the double mould board plough in the same way as dung. Although I think its greatest value is for raising turnips, I have likewise observed it produce a powerful effect on drilled *beans*, *potatoes*, and *young grass*. I cannot yet say much about its after effects on the succeeding crops, but I have not as yet perceived anything unfavourable to it in that respect. I have never yet tested my experiments by

weighing, being satisfied by the appearance, but I hope you will be able to gather from these observations the result of my experience. It is getting fast into repute in this part of the country, and has already brought down the price of most other manures.—WILLIAM TENNANT.

Mr. Clark, of Billiter Street, informs us that

several communications have been received, and others, detailing some very interesting experiments now in progress, have been kindly promised. These are promised to the horticultural public on some future occasion, in a second edition of his "Practical Instructions for using Guano," the first of which has had a very large, and deservedly large, circulation.



BIGNONIA GRACILIS.

THE whole tribe of Bignonia is beautiful, and considering that one or two are hardy, and bloom magnificently on walls, trellises, or fronts of houses, they are not half so much cultivated as they ought to be. The vast majority are stove evergreen climbers; the subject now under notice is of this description,

growing on pillars fifty feet high, clinging fast to any thing by strong hooks, and blooming abundantly with bright yellow flowers. It is not very tender though a stove plant, and should be placed on the coldest part of the house; it is propagated freely by cuttings and requires only ordinary treatment.

#### THE TURNIP, CABBAGE, AND BROCOLI, AND THEIR INSECT PLAGUE.

HALF the gardeners think the black fly is bred in the seed itself, and this opinion called my attention to several points, and this question which fixed my resolution, because (not to dwell upon the circumstance which I never before had occasion to notice in my garden, that seedlings of savoys, London cabbage, beet, &c., have been ravaged by the pest throughout the spring), a row of *Grange's brocoli*, which was sown in May, early, was so mangled, from the first appearance of the cotyledon, or seed-leaves, that, all the season, the plants, notwithstanding the fine rains, were wholly unfit to go either into nursery, or final rows. The *Halicta* has infested the seedling turnips also;

and a neighbouring farmer has been obliged to re-sow a large breadth. Now, by the concurrent testimony of observers and public reporters, the soil was never seen in finer or more friable condition, nor more admirably prepared for the plougher and sower. The winter was so severe, that, as far as the energy of frost was concerned, nothing was lacking either to lighten the soil or kill insects. But, notwithstanding, the beetle has been seen, and its power experienced in numbers, and to an extent that are truly vexatious. Early in the season, it has been ready to pounce upon every vegetable that is suitable to its rapacity. As the fly has proved thus troublesome, I

hasten to communicate what has been observed, and, as suggested, to refer to the remedy which has appeared to prove successful in arresting the course of the destroyer among the seedling London cabbages and savoys. When the insect was perceived, the plants and soil intervening the rows were dusted over, while moist with dew, with powdered lime, partially air-slacked, but quite dry, mixed with about one-third of sea-coal soot. From that day the rows advanced, and a great many fine plants of the cabbage were removed to rows in drills, the holes being filled with water, as the season was dry and parching. Every plant has thriven, and some are almost cabbages.

*Savoys* were also brought to the same healthy condition; lime, soot, and sulphur, tried on the seed, have not effected the *prevention* so highly desirable; but soot contains an ammoniacal, neutral salt; and this salt, when the soot is mixed with quick, or air-slacked lime, is decomposed, by the affinity which the lime possesses for the acid of the salt; and the *ammonia*, being deprived of *that*, its neutralizing component, is set at liberty in the form of a pungent caustic gas, which I imagine becomes the active and immediate agent in either destroying or disgusting the beetles that are within its influence. Let any one take a table spoonful of soot, place it in a deep cup, and blend with it twice the bulk of powdery lime, stirring them briskly together; on bringing the nose close over the mouth of the vessel, he will then, if the two substances be good, be made aware of a gaseous development, which it is not improbable will cause a speedy retraction of the organ of investigation and thought.

I have recited one fact, but the converse of it, that is, another where the same means were adopted without producing the corresponding healthy results, remains to be alluded to, as I deem it calculated to strengthen the surmise of the writer respecting the embryo of the beetle.

The row of Grange's broccoli, sown early in May, appeared to *rise* unhealthy, and though the dusting removed the insect effectually, as it did in the other applications, the plants have never recovered. The attacks of the fly were speedily discovered, and active means resorted to; the row also was watered; and the soil, being a good loam, well enriched with leafy manure, the plants ought to have recovered strength. To prove the seed, a small number had just been steeped an hour in a liquid composed of *sulphuret of lime* five grains, with one ounce of rain water, and three or four drops of sulphuret of ammonia. These substances and their preparation shall be again alluded to. Now, it must suffice to say that the seeds,

smelling strongly, like sulphurous or Harrowgate water, have been sown in the rich hazel loam, where the London cabbages were raised. If the plants rise well, grow freely, and escape the *Haltica*, we may conclude, either that a *preventive* cure has been effected, or that the insects fail to produce a permanent torpor, as it did on the plants sown in May.

#### INJURIOUS INSECTS.—NO. VII.

The Clear-underwing Fly—(*Ægeria Asiliformis*.)

THE caterpillar of this insect bores its way into the trunks of poplar-trees, selecting that portion where they have been stripped of their bark. It then very ingeniously gnaws a chamber or cell, eating towards the outer surface of the wood until it has reduced it very thin, when it desists, and leaves that thin portion to serve as a covering to protect it. No one, looking at that unpenetrated part of the wood would suppose an insect was behind it. When, the chrysalis, however, is in the act of bursting through this thin partition, its abode is easily discovered, and on closer inspection it will be found to be furnished with a sort of lid, which is round and moveable, and of a brown, waxy appearance.

The chrysalis, when ready to transform, protrudes itself partly out of the wooden partition, by pushing its head against it with comparatively great force, which it is enabled to do by first contracting itself, and then by means of the resisting power of the minute teeth or serrated processes with which each segment or ring of its body is provided, it extends its length until it has broken the barrier. The head being protruded, the chrysalis-case splits, and liberates the perfect fly. This possesses many points of resemblance to the other species previously described.

As the caterpillar and chrysalis are seldom to be discovered, and then only when it is too late to prevent their boring the wood, the best plan is to learn to know the fly, and to destroy it when found. Here I beg to observe, that it would be very serviceable if gardeners in all parts of the country would preserve specimens of every species of insect which they find destroying their plants and fruits. Every agricultural and floricultural society should, at any rate, possess a collection of that kind, with the English and scientific names of the species attached near each specimen, for the information of those gardeners who may wish to learn how to tell the several injurious species when they see them again, or to learn the name and nature of any particular one which they believe to have destroyed their crops or plantations.



The Magpie Moth (*Abraxas Grossulariata*).—The caterpillar of this insect has ten feet; and is rendered very conspicuous by its being white, with a yellow band down each side, and black spots on its back. It feeds to a woe-ful extent on the leaves of gooseberry and currant bushes, and of the black thorn. When it walks, it does not proceed continuously, but first extends the fore part of its body as far as possible, and then stops and draws its hind legs close up to the front ones, so that its back becomes raised up like an arch; it then extends its head forward again, and again stops to draw its hindmost legs after it, and so on repeatedly to the end of its journey. Some of the caterpillars live through the winter on the branches, or under palings, where they become wholly or partially torpid, remaining motionless for several weeks together, until some very great change occurs in the weather. As soon almost as the spring has induced the gooseberry and currant to put forth their tender leaves, these caterpillars begin to eat them. One reason why this species is generally very abundant, is the singular fact, that, from some offensive property it possesses, all the small insectivorous birds refuse to feed upon it in any one of its three stages of transformation. A whiuchat in confinement has been known, when very hungry, to swallow one of the moths but he would not take a second; and a tree-pipit rejected one from his mouth, as soon as he tasted its repulsive flavour. Gardeners must not, therefore, leave it to the small birds to kill these destructive insects. Early in the cool of the morning, when they are most easily found, all these conspicuous caterpillars might, in an ordinary sized market garden, be collected by the hand in a very few hours. The most economical and effectual way of destroying them when gathered, is by throwing them to the poultry, which will eat them greedily. Burying insects in holes, although a common practice, is the very worst that can be adopted as a general plan, unless quick lime or some other corrosive substance be thrown over them; for, otherwise, this is only saving many of the insects the trouble of digging their own way into the earth, when ready to change into the chrysalis state, underground.

The chrysalis of this insect is black, striped with yellow rings, and is attached to the plant by a silken cord.

The moth appears towards the end of July. It is nearly two inches in the expanse of its wings, which have several irregular rows of roundish black spots on a white ground, with a yellow band towards their hinder margin. When resting, these are expanded horizontally. Its body is yellow, and also spotted with black,

its antennæ, commonly called *horns*, are straight, and thread-like.

The Furniture-beetle (*Anobium pertinax*).  
 The Savoyard-beetle (*A. tessulatum*).  
 The Striated Timber-beetle (*A. striatum*).  
 The Herbarium-beetle (*A. castanea*).

The little grubs of these beetles gnaw round holes, similar to those made by a fine gimblet, in old wood, eating it away atom by atom; and as they remain three or more years in it, they commit very great mischief.

Stephens enumerates ten British species.—They are all remarkable and celebrated for producing a ticking noise, which alarms the ignorant and superstitious, who term them *death-watches*. The furniture-beetle (*Anobium pertinax*) clicks oftener in the night than the daytime. Rennie observed, that when it clicked, it moves its head up and down like a hammer, but he could not be certain that it struck the wood. Derham kept a male and female of the Savoyard-beetle (*A. tessulatum*) in a box, and by imitating their noise, he used to make them tick whenever he pleased. After keeping them for about three weeks one of them died, and the other escaped soon afterwards, by gnawing through the box. Mr. Stackhouse, who also kept some of this species in a box, and carefully watched how they produced their ticking noise, says, they raised themselves on their hind legs, and with the body somewhat inclined, beat their heads with so much force and agility against whatever they stood upon, that one of them resting on a sedge-bottomed chair, beat the sedge until its blows were visibly impressed for a space equal to that of a silver penny. Mr. Alexander Griesbach saw one of this species, upon a decayed oak-tree in Windsor Forest, throw back the head and front part of its body, resting itself meanwhile on its hind legs, and then, by suddenly jerking its head upon the surface of the wood, whereon it stood, produce a sharp sound. Latreille, the celebrated French entomologist, remarked, that when the striated timber-beetle (*A. striatum*) beat upon the outside of a pile of wood, another one answered its tapping from within: and he says, indeed, that their ticking is nothing more than their mode of calling one another—of one sex courting the other sex. Those people, therefore, who are alarmed when they hear one of these beetles inviting its mate, might just as well be terrified when they hear the cooing of doves.

In this country the grubs of these insects do considerable injury to old furniture, banisters, beams, &c.; but abroad their ravages appear to be still more serious. Mr. W. Spence says that in passing through one of the streets of

Brussels, he noticed the extremely worm-eaten appearance of the ends of some large old oak-beams, lying opposite to a house which had been entirely gutted, in order to replace them by new ones. He found several specimens of the Savoyard-beetle (*Anobium tessalatum*) remaining dead in the holes wherein they had undergone their transformation, and from some cause had not been able to escape. "Several of the holes were visible in the upper angles, and the beam where the joints had been inserted, but it was at its ends, and especially at one of them, that they chiefly abounded. Here, for about a foot and a half of its length, and through nearly the whole of its thickness, which was fifteen to eighteen inches each way, the holes, which were of about the diameter of a small quill, were so numerous and so close to each other, as exactly to resemble a honeycomb, the portion of wood that still divided them from each other being often scarcely at all thicker than the wax between two cells; and the whole end was thus in such a state of decay, that if the beams had not been removed, the floors of the house must have soon fallen down. The same expensive process of removing the whole interior of the house, arising from the same cause, is requisite every year in several of the old houses of the city. This insect thus puts the citizens of Brussels to an expense of probably several thousand pounds, much of which might have possibly been always saved, had the real cause of evil been known, as the examination of the beam-ends in suspected cases would be easy, by removing a portion of the floors, when its existence would be at once seen by the large quantity of sawdust-like excrement produced; and it perhaps would not have been difficult to put an effectual stop to it, by wetting the part thoroughly with a solution of corrosive sublimate." — *Abridged from the Entomological Society's Transactions.*

Two things occur to me as likely means to prevent articles of furniture, such as tables, bedsteads, &c., being attacked by the *Anobium* and other insects. The first is to have the wood saturated with Kyan's patent preparation; and the second is to rub them often with bruised laurel leaves, which are known to emit a small very destructive to insects in general. When these insects have already re-established themselves, the best method of destroying them is by pouring hot water on the timber.

The *Anobium castaneum* infests dried specimens of plants. Some persons have advised that each plant should be washed with a solution of corrosive sublimate; but this is not merely a troublesome and expensive receipt, but an uncertain one. It is much better to

hang some little gauze or cambric bags, containing camphor, within the drawer or cabinet containing the plants. This of course will not expel the grubs which are introduced into the drawer along with the fresh specimens, but as soon as they become beetles, it will drive them away before they have deposited any eggs to breed another generation of them. The drawers or cabinets may likewise be rubbed with bruised laurel leaves; and some of them may be placed in the gauze bags, instead of camphor, if preferred.

#### FLORICULTURE.

THE Older writers were evidently in their day as fond of theories as those of the present period, and mixed up with some practical and useful remarks may be found a good deal of idle and mischievous speculation. The leaven of mischief had not passed away, even when practical men begun writing, and in the cultivation of florists' flowers they were not only recommending that which they had found answer the purpose, but added a good deal which they had collected from the more polluted sources of information. It would be a difficult task to examine all these writings, and to re-publish such as could be proved to be good; yet to be really useful we must shew the mischievous effects of much that has been handed down to us as instruction. Mr. Loudon industriously collected most of the very striking lessons written for us by old florists; and to a person in practice, who has studied the subject, the directions which their own experience told them might be tried with some hope of success, possessed interest, while they would almost decide for themselves against that which would have a contrary tendency. Not so, however, with young and inexperienced florists, who pursued the science with alacrity, and fell, as might be expected, into all sorts of difficulty and loss. It is true Mr. Loudon gave in most cases his authority, but unhappy experience has, of late days, shown us that such authorities are not to be trusted; nay, even persons of supposed knowledge in these matters, are at this very period giving us, week after week, many directions which prove not only useless but baneful. The best work of the past age was, perhaps, that published for Curtis and Milliken, called the *Florists' Directory*, the principal faults of which are the limited number of the subjects of which it treats, and the common error of addressing the work to those who already know a good deal, instead of going through the whole process from the beginning, in words and sentences which the humbler cultivators would understand. Mr. Hogg, a successful cultivator of carnations and

picotees, gives some excellent lessons in a treatise on the subject. But on tulips he is less successful, for he has adopted a good deal of very questionable and some very unquestionable jargon. His papers on breaking the tulip, and on the use of salt in the compost in which they grow, are as inferior to those on the first-mentioned flowers as theory is inferior to practice. Nor was Hogg exempt altogether from the charge of quackery in his remarks on the mode of causing variegation in tulips, and other subjects on which his speculative and extremely wild theories amounted to absurdity. Nevertheless, his treatise on the carnation and picotee will bear reading, and improve the reader who may fancy he knows a good deal, while it gives excellent lessons to those who do not know anything of the matter. To examine these writings, as well as many others in detail, however laborious, will be a part of our work, and we may be able to do great service by objecting to that which is wrong, but which is uncontradicted, as well as by approving and adding to that which is right. The great fault of the late Mr. Loudon's writings was, that notwithstanding the industry with which he gathered together the writings of all classes, he seemed averse to drawing conclusions, and left his readers in a quandary, because they read several modes of doing things, some right and some wrong, some practical, and others speculative and very doubtful, and found themselves without any decided path pointed out, without any distinct lessons to prefer. Of later times, Mr. Glenny has written a great deal about florists' flowers, and had he not almost indiscriminately condemned almost every other writer, he would have been the most popular by far. It cannot be denied that there are many who admire his practical knowledge, evinced as it has been by the most successful cultivation and exhibition for several years, but who repudiate altogether the egotism which pervades most of his writings, and refuse to profit by his lessons, because they dislike the teacher. It would, however, be equally unjust to withhold from him the praise due to him for the clear and understandable principles upon which he has founded his rules on points of excellence, which at present seem to govern the decisions of the best judges of florists' flowers at horticultural shows; or to refuse our acknowledgment that his notion of setting a sort of model pattern to approach for every flower of any importance at exhibitions. We are not about to set up rival patterns, nor to take any credit for originality as to what has been termed the properties of flowers, because we feel that we shall be unable to mend the examples laid down; but we shall by those

very tests carefully try the leading varieties of whatever comes newly upon us, and decide how nearly they approach, and in what particular they are deficient. We are not quite sure that we shall agree with Mr. Glenny's practice in all things, nor with the manner in which it has been enforced; and we are quite certain we shall dissent from many of the points which he urges over and over again, when condemning as he does, without mercy or moderation, whoever has ventured to oppose him. No other writers publicly known seem to have taken up the subject of florists' flowers of late years. There have been treatises in periodicals, mostly anonymous, though none have been well done. There is, however, plenty left to do, and we must attempt to do it. We observe a complete movement in the floral world, and would willingly improve it, for nothing would give us more pleasure than to see the excitement of 1836 resumed, and the science rapidly advance. But florists who are interested in it should lend a helping hand—next to selling (or, perhaps of more importance as a first cause), their object should be to contribute all they can to the successful cultivation of floral objects. If any of them know a means by which success can be increased, they should contribute it to the benefit of the amateur grower, that he may be encouraged by his improved culture to go more deeply into the fancy. But, says the florist, I cannot publish that which I know to the amateur grower, without my rivals in trade becoming as wise as my customers, and therefore the means by which I can sell better and stronger plants than my rivals must be kept to myself, or I shall be worsted by my attempt to do good. There is some truth in this; but the rival, though more successful in growing and producing for sale strong plants, cannot take any customers worth keeping. People who have been well used for years, do not run away without a cause, and after all has been told that can be told, those who change their system, or adopt new means, will be some time before they beat the teachers. We hope, therefore, to be the means of communicating the lessons given by professional florists, as well as lessons from our own experience; for certain it is, that with the exception of a very few treatises in periodicals of late date, and the writings we have mentioned, there is nothing that can teach the young beginner how to set about his new fancy, and begin at the beginning.

#### AGRICULTURAL CHEMISTRY.

SUCH is the title of a book just published by Simpkin and Marshall, for George Cox, who

appears to be a practical chemist, as well as an optician, and has provided, for those who are fond of analyzing, a chest containing the necessary apparatus. The book is useful to those who are anxious to follow up the present fashionable mixture of agriculture and chemistry, which though like almost every thing novel, is for the present all the rage; and from which wise men will probably learn something, while enthusiasts throw away money and time in silly experiments. The value of science depends entirely upon the good that it works. If after turning barns into laboratories, and farm houses into druggist's shops, we find that the produce of an acre is materially increased, we shall admit that some good has been done by agricultural chemistry. Indeed, it would be unwise even now, to question whether good has not already been done, but like all other novelties in science and practice, the thing has been carried and is still carried to extremes, and some who have boasted that they could carry the manure for an acre of land in one coat pocket, have found that they could bring away the crop in another. Mr. Cox's book is a sound practical treatise on Chemistry, as applied to agriculture; and contains instructions that may save many useless and unprofitable experiments. As the author says, the book may properly be divided into two parts: the first, treats of the properties of those bodies which either enter into the composition of a plant, or affect its condition. In this portion of the work will be found many original practical hints and suggestions for the manufacture and application of manures. The great consumption of soluble silica by the cereals and grasses must render any process which will procure a cheap and abundant supply of that great essential, a valuable addition to agricultural information. Under the head Silica, that information will be found; but it must be borne in mind that it is essentially necessary to employ sand of as fine a grain as can be obtained. This fertilizer will be found an invaluable agent on those soils which yield a deficiency of straw. The fact that gypsum converts the very soluble carbonate of potash into the nearly insoluble sulphate of potash, will prove a truth worth knowing by those farmers who are in the habit of using wood ashes. The article headed Potash also contains some hints on the application of liquid manure to the land, which it may be worth while to consider before an expense is incurred in purchasing the apparatus necessary for its distribution. It is repeated here, with an increased conviction of its truth, that rain water and irrigation are the best and only necessary forms of applying liquid manure to the land. The nitrogenous phosphate manure mentioned at page 20, is

cheap in its manufacture, and an efficient mode of employing urine in a convenient manner. A compost, consisting of equal parts, by weight, of burnt gypsum, and putrified urine, well mixed with a third part of bone dust, made some months ago, has retained all the ammonia of the urine, and is in a state exceedingly well adapted for drill or broadcast. In the chapter on Lime, will also be found some suggestions for the solidification of night-soil, well worthy of immediate attention. The application of night-soil to the land, in a proper form, would doubtless prove a great source of national wealth. Let a trial be made by the enlightened and intelligent farmer, and a fair and impartial verdict be given. Almost all journals are open for communications of this nature, so that doubt need not exist any longer on the subject. It may be said that there is *no doubt*, as such manure has long been employed with advantage to the speculator, and its efficacy fully established. The answer is, that if its efficacy were admitted, and understood, it would be more generally employed. Now is a good time to give it the trial it demands; and a ton of it, sufficient for six or seven acres of land, can be manufactured at an inconsiderable cost. A hundred weight of gypsum is capable of rendering friable a hundred weight of mixed excrements. When the constitution of other manures is placed by the side of this, the economy of its application must be at once acknowledged. Nearly all the quotations made have been taken from Liebig's celebrated work, entitled "The Chemistry of Agriculture;" and, indeed, it was impossible to write on the subject at all without going very frequently, and always with profit and satisfaction, to that fountain head. The second part of the work treats entirely on analysis, and the mode of detecting the various simple and compound bodies which are found in soils, manures, and the ashes of plants. These analyses are given with entire confidence, as most of the facts are taken from authors of known precision. Mr. Parnell's work, on "Chemical Analyses," is recommended as a great assistance to those who have not sufficient confidence in themselves. A person unacquainted with the first principles of chemistry, cannot, of course, expect to be in a condition to follow out the plans laid down for investigations of this kind. To such an one is recommended the immediate and attentive perusal of some elementary treatise on the subject, and a vigorous effort to make himself perfect in the various modes of manipulation necessary in chemical research. Where great nicety is not required, a chemical analysis is by no means so difficult a matter as many imagine; but, to succeed to any great extent in chemical investigations, great

care and caution is always requisite. Earnest endeavours have been made to render "The Agricultural Test Chest," complete for the purpose intended, viz., that of enabling its possessor to successfully undertake analytical investigation connected with agriculture. The only exceptions to its being entirely complete, are the omission of a platinum crucible, a silver crucible, an agate mortar, and a Rose's Argand spirit lamp. Now, the latter would have increased the bulk of the chest too much to render it conveniently portable; and it fortunately happens that it may now be displaced by a smaller lamp, since the announcement made by Leibig, that fluoride of ammonium is a more valuable and correct agent in disintegrating siliceous minerals, and for calculating the quantity of silica present, than the old method usually adopted. In the *Lancet* of September 7th, the following occurs in one of Liebig's lectures on organic chemistry. "A useful application of fluoride of ammonium has recently been discovered in mineral analysis. Fluoride of ammonium is easily obtained by saturating silicio fluoric acid with carbonate of ammonia, and boiling; the hydrated silicic acid separates, and fluoride of ammonium remains in solution. This solution, when in a state of concentration, etches glass, in the same manner as fluoric acid. The fluorine goes off with the silica of the glass as fluoride of silicon. I need scarcely tell you, gentlemen, that such a solution ought not to be evaporated in glass or porcelain vessels, but in evaporating dishes made of lead, silver, or platinum. Fluoride of ammonium is of particular value as a means of rendering minerals containing silica soluble. The usual methods of fluxing are laborious; and, after all, uncertain. By adding dilute sulphuric acid and fluoride of ammonium to the mineral, all the silica is made to separate, and to go off as fluoride of silicon, whilst all the other constituents are obtained in solution, combined with the sulphuric acid." The other articles omitted, were left out on account of the price, which would necessarily have made the chest at least two guineas higher; and, as they are not necessary in all operations, it was thought better to give the price merely, and then they can be included, if desired by the purchaser. A serviceable platinum crucible is worth from a guinea to 25s. The price of an agate mortar of sufficient size is about 14s., whilst a silver crucible or dish can be had for 10s. If the purchaser of the "Agricultural Test Chest" should not be sufficiently informed of the distinctive character and properties of those bodies most likely to come under his more frequent observation, he had better study the chapter on Qualitative Analysis, before he undertakes a complicated

investigation. For instance, let the student precipitate a mixed solution of phosphate of soda and sulphate of soda, with a solution of chloride [of barium. If the precipitate be washed and digested in dilute nitric acid, he will find that a portion of it is taken up, and a portion left untouched. He will learn by this that phosphate of baryta is soluble, and sulphate of baryta insoluble in nitric acid. These are the characteristics by which one body is distinguished from another; and, of course, it requires some little acquaintance with these characteristics, to enable an operator, to proclaim, with anything like certainty, what the nature and composition of a body submitted to his judgment is likely to be. We recommend the work to every one who has a notion of experimentalizing on Agricultural Chemistry.

#### THE FAMILY OF ORCHIDACEOUS PLANTS.

THERE is not a single natural family besides this throughout its whole extent, in which certain features of resemblance do not indicate a relationship, or as it is technically called, an affinity with some other, frequently with many; circumstances upon which, indeed, the arrangement of these orders has by most authors been founded. But the Orchidaceous, unless in the possessions of organs which are common to all flowering plants, have none of these tokens of affinity; the superficial observer is always struck by their singular appearance, but the botanist is only capable of reconciling the apparent anomalies in their structure, by considering them as resulting from imperfect development of parts. The greatest deviations from ordinary structure are exhibited in the flowers of this curious group, and theory has been busy, as well in regard to the identity as to the functions of the organs of which these are composed, compared with those of correspondent situation in the rest of the vegetable world. To quote from portions of a lecture read by Professor Johnson—The orchidacea are for the most part herbaceous plants, a very few only assuming a semi-frutescent character. Their roots are composed of simple cylindrical fibres, which in the herbaceous species are often accompanied by one or more fleshy tubers, formed possibly by the dilations of the fibres, and always bearing on their summits the buds of the succeeding season. Sometimes the roots are fascicled or collected, in a bunch like those of the commelina; sometimes the fibres are connected altogether in the upper part, forming a fleshy flat tuber, from the base of which their extremities diverge like so many fingers, and such are said to have palmate roots—in other species succulent, bulb-like

stems, are formed by the bases of the leaves cohering—in others the stem is extended in the form of a tortuous thimosa, rooting as it increases in length. The leaves are always entire, alternate, and usually sheathing at the base; but in some species they are articulated there, especially on the caulescent and shrubby species, which is far from being a common feature in indigenous plants, to which this tribe belongs. The flowers are said to be superior, that is, placed above the part which eventually becomes the fruit or seed-vessel; this part, which is technically styled the ovarium, is seen in all of the orchid, as a thickening of the upper part of the stalk which supports the flower, and often indeed supplies the place of the stalk; it may be readily distinguished by its form from a mere fruit-stalk, which is always cylindrical, by being angular or grooved, and these angles or sections are always in number either three or six, and more or less twisted like the worm of a screw. The perianth, which is in common language the flower or blossom, consists always of six pieces, three of which belong to the calyx or flower cup, the other three to the corolla; these pieces, however, vary much in different species both in form and colour, and it is not always very easy to ascertain to which of the two series they individually belong, unless by reference to their relative position. Every practical botanist ought to be aware that the disposition of parts in a plant is in agreement with natural laws, as unalterable in their operation as those which determine the limbs of an animal, and that the flower of a rose or of an apple placed upon its stem in any other position than with the odd or fifth segment of its calyx turned towards the axis or trunk of the plant, and the odd or fifth petal turned outwards or away from it, would be preposterous. Now, in all orchid. the true position of the calyx is the reverse of that of the rose, viz. the odd segment should point outward; but the ovarium, which supports the flower, being twisted, throws into the contrary direction, and it does, from this circumstance, always point upward or inward, while, as a necessary consequence, the third or odd petal points downward or upward. This petal, which is generally larger than the rest, and variously shaped, is called the labellum or lip of the flower, and is frequently protracted at its base into a hollow process, called a *spur* from its figure. Now, from what has been stated in previous lectures, it might be expected, as a necessary consequence of the ternary arrangement of the calyx and corolla, that the stamens would be three in number at least, and the pistils either three, or the ovarium three-celled: the latter is undoubtedly the case; but the stamens and

pistil, or rather its style or stigma, are very obscure. In the centre of the flower we always find a column or fleshy process, varying in figure in different species; this process is sometimes styled the *gynosteme*, and, by dissecting the flower, we find that it terminates the ovarium, or rather is a continuation of that organ, and it is considered to be formed of the filaments of the three stamens united with the style of the pistil, the character of the Linnæan class gynandria, of which the orchid. are the only legitimate examples. It is not easy to ascertain, without very close investigation, the economy of these organs, which were indeed, until a very recent period, but imperfectly understood. The stigma, or summit of the pistil, is, however evident upon the forepart of the central columns or *gynosteme*, in the form of a little cup secreting a viscous fluid, immediately above which is a distinct two-celled anther. Now, this anther is undoubtedly the central one of a series of three, the other two being imperfect, or rather abortive in almost every instance, and their places only occasionally indicated by little tubercular petaloid, or filamentous projections, one on each side of the column. It might be a question how we know such little processes as these to represent abortive stamens, and what foundation we have for regarding these flowers rudimentally triandrous; and it would be difficult to maintain the justness of the supposition by any other arguments than those drawn from mere analogy with the relative numbers of the sepals, petals and stamens of other plants, which are either equal to, or multiplies of each other, did not nature herself in a few, as it were accidental instances, perfect two or three anthers in these flowers instead of one. Dr. Brown has recorded instances of this kind, and having met with several myself in some of our British orchises, especially *O. mascula*, the common early orchis of our woods and pastures, I am inclined to think they are far more frequent than has been hitherto supposed. This, however, is a circumstance not bearing upon our subject, because a single specimen is sufficient to decide the fact that the present theory of the structure of orchid. flowers is correct. The pollen of orchid. is very unlike that of most other plants, being generally aggregated in masses, a feature of rare occurrence, and hitherto only observed besides in the natural order Asclepiadaceæ, and some Mimosæ. The several diversities which it presents in different genera have afforded botanists characters for separating this very numerous order into several sections; thus, in *Limodorum*, *Epipactis*, *Neottia*, and some other genera, the pollen is farinaceous, or pul-

verulent, nearly as it occurs in plants generally. In *Orchis* itself, *Ophrys*, *Serapias*, &c., the Aphrydea of botanists, it is associated in masses which are indefinite in number, and attached by elastic filaments that terminate in a viscid gland the grains of pollen in this modification, whereby a viscid fluid, that draws out in the form of threads when we attempt to separate them. In *Epidendrum*, *Malaxis*, *Zygopetalum*, and others, it is united into larger masses, few in number, and of a hard wax-like consistence, often, indeed, solid, or inseparable into distinct grains; the number of these masses is from one to four in each cell of the anther. These differ in a very important feature of the fructification; they have been long noticed as characteristic of three very natural divisions of Orchidaceous plants, and are the foundation of the far more elaborate classification of Drs. Brown and others. In regard to the impregnation of the seed in Orchidaceous plants, or rather to the mode in which that important object is effected, there is some difference of opinion, certain botanists being satisfied that it takes place, as in other plants, by the emission of pollen tubes which penetrate the tissue of the stigma, while others contend that the contents of the pollen are either taken up by the stigmatic secretion, or that an abortion of it takes place through the gland into the ovary through the medium of a very distinct canal or tube, traceable in most of the plants of the order as opening from the cup-like stigma, and leading into direct communication with the ovules. It may appear a little remarkable that so important a circumstance in vegetable physiology, and which simple observation of a number of species would, we might reasonably suppose at once decide, should yet be in abeyance: but in a tribe of plants whose pollen is of so diversified a structure, it is possible that different modes of action may prevail. In those instances, however, which have fallen under my own observation, I have seen no reason for supposing that there is any material difference in the action of the pollen of the orchidacea, and that of other flowering plants; but these instances have chiefly been obtained from a single section in which the pollen is all of nearly the same structure. The obscurity that involves the functions of these flowers, and the equivocal characters of the anthers and stigma in numerous instances, is still, and will probably long continue an obstacle to the profuse production of varieties which has followed the efforts of cultivation in other tribes. And at the same time, the daily importation of new species is calculated to check the desire of the cultivator to vary by his art those which he at present possesses; a cause which it is likely will

operate for an indefinite period. No natural order of plants presents such numerous and diversified modifications in the flowers as this, although in general features so strikingly characterised that a single glance is sufficient to distinguish an Orchidaceous plant from one belonging to any other tribe. The proportion, arrangement, hues, and outline of the several organs of fructification are so varied, and give rise, in these variations, to so many grotesque, imitative, and beautiful combinations of vegetable feature, that the most incurious eye could scarcely fail of being interested in beholding them. The popular names by which many of them are known, and which are founded upon fanciful resemblances to different animals, are sufficient evidence of this. Witness the names of many of our native species. We have the *Bee* and the *Fly*, the *Spider* and the *Drone* orchises; the *Butterfly* orchis; the *Lizard*, the *Frog*, and the *Man* orchis. Nay, the resemblances in some of these instances are almost even beyond the mere creations of fancy, particularly in those of the insectivorous species. What may be the object of Nature in the remarkable deviations here presented, compared with the ordinary forms of flowers, it is difficult to conjecture. To assign to mere caprice an imitation of the forms of one kingdom in the individuals of the other, where the wisdom of the creating and directing power of the universe is to be adjudged, would be absurd; but that this mimicry is destined to some well-designed end, we may venture to guess. Is it intended to protect the pollen from the depredations of those insects which collect that of other plants for food and other purposes? Some grin like monkeys; others resemble enormous spiders, or some other ravenous insect, with eyes fixed, and claws extended to seize its daring depredator. But whatever may be the source of these sportive, and sometimes ludicrous, resemblances, the Orchidacea form an order universally admired for their beauty, which is often allied to the most exquisite perfume; and the singularities above alluded to will always render them objects of high interest with the practical botanist, as well as with the less scientific observer. The genus *Cypripedium*, or *Lady's Slipper*, differs very remarkably in the floral structure, from the rest of the Orchideæ, having two stamens instead of one: hence it is the type of a section, of which it is the only member at present. The solitary stamen in the plants of the remaining, I have observed, is to be regarded as the central one of a series of three—the rudiments of two others being often traceable, and, in occasional instances, developed. In *Cypripedium* the two lateral stamens are developed, while the central one

is wanting; thus furnishing an additional proof were one required, of the correctness of the present view of the structure of orchidaceous flowers, and the source of that remarkable deviation from normal or regular expansion which they exhibit. The labellum, or lower lip of the corolla, is a very prominent feature in this genus—being inflated and, bearing some resemblance to an oriental slipper; hence the name from *Cypris*, *Venus*, and *Podion*, or *Slipper*. The cultivation of orchidaceous plants has, within a few years, been brought to a degree of systematic excellence, which would appear, at first sight, to have left very little room for improvement; but this is yet far from being the case, as whoever grows them to any extent has continually to deplore the loss or gradual deterioration of numerous species, under the treatment to which they are subjected. It is no part of my lecture to enter into any discussion of the propriety of any general mode of culture, the comparison of which can only be justly made when put to the test of experience;—one mode may be favourable to the growth of some species; but a very egregious error is certainly committed by most collectors of this beautiful tribe, who treat them all alike. A high temperature, shaded houses, almost dripping, atmosphere, are the conditions under which the torpical *Orchidaceæ* are kept in this country; and to many the condition is highly favourable, coming near as it does, to that under which they are found in a state of nature; but it is undoubtedly injurious to others, and too little attention is paid to the geographical and physical conditions from which they were originally transported. Until these circumstances are recognized, cultivation may be partially successful, but it cannot become generally so; and a very large proportion of this varied and beautiful family will only be introduced, to be lost and regretted. Few natural orders have a wider distribution than *Orchidaceæ*; they form a part of the scanty flora of Lapland and Siberia, almost on the borders of the frozen ocean; inhabit in considerable numbers the temperature countries of both hemispheres, but contribute more especially toward swelling the rich catalogue of tropical vegetation. In our own island we number about forty indigenous species, and in the temperature and colder regions throughout the globe they are met with on the dry upland pasture as well as in the moist meadow and the wood. But under the influence of a tropical sun, the damp rocky valley and the forest, impervious to his beams, are their favourite habitats. In those districts they are frequently aerial plants or epiphytes, not vegetating in the soil, but attaching themselves to the trees forming the primeval forests of the

Brazils and Chili, the East Indies, and the Islands of the Torrid Zone; rooting among the ferns and mosses that clothe their trunks and branches, assuming the most elegant and fantastic of their forms, and diffusing the most delightful odours. Such are the numerous species of *Dendrobium*, *Epidendrum*, *Oncidium*, and other genera which at present contribute almost exclusively to the collection of the European cultivator. Many of these seem to derive their nutriment chiefly by absorption from the atmosphere, and are capable of subsisting for weeks, and even months, suspended from the ceiling of a chamber without any visible support—indeed the genus *Arides*, or air plant, derived its name from the use to which the Chinese and Japanese apply it, in consequence of this property, and the fragrance and beauty of the flowers. They take it from the trees just before the flowering season, and entwine it as an ornament within their houses. The daily improvement of floriculture leaves us not without hopes of seeing ere long some of these singular plants thus displaying their beauties in the drawing-rooms of the wealthy, and the study of the amateur in England, the more so that some species of *Dendrobium* and *Cymbidium* really require a dry or only moderately moist atmosphere to vegetate in, and that other epiphytic species are known to flourish in climates where they are occasionally liable to frost and snow.—Beautiful and interesting as they are, the *Orchidaceæ* are among the least useful to the wants of many of the natural tribes that the vegetable kingdom presents. The bulb-like bases and tubers of some species contain a substance, which when prepared for use, is known by the name of Salep, or vulgarly Saloop; and is so nutritious that it is considered to contain more actual food in proportion to its bulk than any other vegetable product. It consists almost wholly of a principle called by chemists Bassorin, which forms a jelly with water, and by long boiling is convertible into a matter resembling gum arabic. Salep is much used by the Mahomedans, especially in Turkey and Persia, and its English name appears to be a corruption from that by which it is known in the latter country, viz., *Sahleb*. It was, many years since, a constant article of importation into Britain. The value of Salep as an article of food will be readily understood, when it is known that an ounce a day is sufficient to sustain the life of a man, and that for many days together; on this account it is highly esteemed in the eastern countries, and forms a large proportion of the provision of the caravans and pilgrims who traverse the Arabian deserts. The aromatic substance called *Vanilla* is the fruit of a climbing *Orchi-*



daceous plant, a native of the West Indies—the vanilla aromatic; its chief use is in flavouring chocolate. Several Brazilian species of *Catasetum*, *Cyrtopodia*, &c., contains a viscid juice, which, when boiled to the necessary consistence, is employed as a cement in South America, in the manner of glue. The roots of some others have astringent properties, and have been employed medicinally, it is said, as tonics; but they are at best remedies of very small account, so far at least as observation and experiment have hitherto extended. One circumstance deserves recollection in this view of the *Orchidaceæ*, it is the total absence throughout the order of deleterious or poisonous principle.

#### THE BEST SIX ANNUALS.

WE have taken the head of this article from a list of prizes to be given at a Horticultural Show, and here we should be inclined to find fault, the prize is to be given either to something very indifferent, or there is a wide field to choose in, because annuals are annuals, and there are thousands of them; one may produce sweet peas, ten week stocks, lupins, larkspurs, convolvuluses, and China asters, another may find balsams, cockscombs, *Rhodanthe Manglesii*, *Clintonia pulchella*, *Nemophylla Insignes*, and *Colinsia Bicolor*. There is no small difficulty in deciding upon the merits of those things, because there are some who assert that novelty has a good deal to do with the business, whereas, if the best is to win, they must like all other matters of the kind be judged by properties. The balsam for instance, well grown, is a perfect picture. *Rhodanthe Manglesii* is a delicate and beautiful plant, as unlike it as St. Paul's is to the Monument: the cockscomb is a coarse monstrous dull coloured excrecence, as it may be called, for there is nothing like a flower about it. The *Clintonia pulchella* on the other hand is a rich mass of small but bright flowers, hardly showing whether the plant has a leaf or not, from the abundance of the bloom which conceals the foliage. *Convolvulus minor*, which is better than *convolvulus major* to show, is a large deep funnel-shaped flower, dark blue and white, with coarse foliage, and very bad habit. *Nemophylla insignes*, on the other hand, is a small, shallow, funnel-shaped flower, of the brightest blue, with handsome foliage, and not too much of it. Sweet peas are stragglers, but still pretty though common. Larkspurs, on the other hand, may be found dwarf, compact, and diversified in colour, very double, with handsome spikes of bloom. *Colinsia Bicolor* would match well with larkspurs, and a bal-

sam in the middle would make the back row. *Nemophylla Insignes*, and *Clintonia Pulchella* would do for the front row, with *Rodanthe Manglesii* in the middle; these are not necessarily the best annuals, but they are showy, and perhaps if well grown have the attributes of good annuals. They have all a large portion of flower to a small portion of leaf which is one good property; they are for the most part rich in colour, but as *Rhodanthe* is almost too delicate to be one of six gay annuals, *Erysimum Perofskianum*, would, with its rich orange coloured flowers, make an excellent centre in front; but all such prizes are too indefinite. The annuals required ought to be tender, hardy, or half of each, because any body would be in the dark, as to which of the thousands he is to show. However, had it been more clear, there had been less excuse for an article on the subject. It will at any rate be found that very few half dozens would be fit to show the same day against those we have mentioned. The principal thing to observe in respect to the growing of the specimen pots, is to attend to their habit. If one be naturally taller than the other, stunt it by keeping it dry. Annuals, perhaps never look better than when sown thick and first opening their main spikes or trusses of flowers. The larkspurs *Colinsia*, and *Erysimum*, may be sown thickly, and be thinned out to four or six good plants. The *Clintonia* and *Nemophilla* may be sown so as to have four or five plants. The balsam is shown singly of course, and is only fit to show in a back row among such small plants, but there are those who would select the cockscomb, globe amaranthus, ice plant, egg plant, and sweet peas, or some other gaudy thing to place with the balsam, and there are those who would give the prize to the growth instead of taste of selection. It is this which induces us frequently to object to prizes given for such indefinite productions. It would puzzle a good many to show that a *Nemophilla Insignes* is a better annual than a sweet pea, for the latter has a perfume which the former has not; yet the former would in nine cases get the prize, because it is not so old nor so common, but people ought not to be left in doubt as to what they should exhibit, where there is such an enormous field; narrow it, say they shall be dwarf, and it puts out all tall ones; say that they shall be tender, and it turns out all the hardy ones; say that they shall be hardy, and it excludes all the tender; any thing that lessens the choice is useful, but it would be still better to mention the kinds, if they are old ones, for there would be more uniformity in the show, and the judges could see better which deserved the prize.

## A FEW WORDS OF OURSELVES.

THE nearer we approach to the close of a volume, the more we are called upon to look back upon our work, and see if anything is left undone that ought to be done; and more especially as the path we have trodden, and which was new when we made it, is so tempting to others, that they follow close at our heels, with every disposition to pass us. Now we never intended this, and therefore made a path just wide enough for one to travel well on, but too narrow for two. We think, too, that we provided good accommodation for all the passengers on the road, so that any attempt to run us down must be made for the purpose of buying us off the road, or forcing us to keep up the opposition. Well, looking at the past, we have little to reproach ourselves with. We have always paid for, and had the best cattle we could get—no good working animal was ever offered us that we did not try, and so long as he was of service, keep. Now and then we have had a leader try to bolt, and a wheeler jib; but as we knew how to handle the whip and the rein, our journey has been made with whole bones, though a timid passenger or two have occasionally grumbled. Let us for awhile drop our figurative and use homely language. We hope and believe that so far as we have yet proceeded, there has been very few articles inserted in the work that are not useful, and very few instructions required by the most fastidious reader, that may not be found. We may be accused of egotism, but we nevertheless opine, that by the help of very excellent practical contributors there has been collected into our work the ideas of the best writers of the day; the experience of the most successful cultivators; the thoughts, words, and works of many sound-thinking, sound-reasoning, and experienced teachers: we believe there are few subjects on which there are not hints and instructions that will be useful even to those who think they know everything; and we trust, that by seeking among clever practical gardeners of all countries, and artists of known talent, and by retaining those who seize upon novelties as they turn up, and make the most of them, we shall be able to produce in 1845, a miscellaneous volume, as useful and as acceptable as that now closing has proved. But we may fairly put it to our readers, whether any work has appeared which has in it so little useless or trumpery matter, or so much that applies to the wants of every owner of a garden. We have seen a whole volume devoted to the dahlia. Is there any one that will venture to say, honestly, that there is in it half so much real instruction as we have given in our comparatively short treatise? We

have seen elaborate writings on the rose—are the whole of the works combined so useful or instructive as our treatise on roses in pots, or the subsequent treatise on the rose in general? The volumes on the vine and the erica, though expensive, are neither so plain nor so complete as the comprehensive treatises which we have given in a few pages of *The Gardener*, while series of short papers comprised in these volumes, are as complete in themselves as if they had been stretched after the fashion of modern book-making into expensive tracts, or lengthy pamphlets. And as yet we have only been providing for those who are unacquainted with gardening as a profession—amateurs, who garden for pleasure and recreation—cottagers, whose means and conveniences are limited—youth, who desire to make practical gardening a branch of their education—in what existing work, let us enquire, can be found such directions for gardening every month in the year?—directions which a child may understand, but which would, if followed, give results that would be satisfactory to the finished gardener: not that they are impudently addressed to masters of their business, or that they give an amateur reason to believe he can do without a gardener, where the higher branches of the science are required. We have respect enough for the profession to believe, that those who have the care of the stove, the pinery, the peach and cherry house, and the forcing of fruit, are fully competent to the task they have to perform, and that however well acquainted we may ourselves be with all that relates to them, it would be insulting to head gardeners to dictate to them, and deceiving amateurs to lead them to believe they can do without proper gardeners. It has been our aim all through this work to uphold the claims of the British gardener. We have never attempted to make employers dissatisfied by leading them to expect too much. We have been as careful to encourage them, by showing how much can be done with limited means. We are fully sensible of the great mischief that has been done to the gardening profession by constantly recommending new plans and processes, which keep gardeners always in confusion, and engaged in perpetual changes; and we have been more anxious to give praise for the production of fine fruit, flowers, and vegetables, by ordinary means, than we have to point out the wonders said to be effected by newly-constructed buildings or new processes for heating them. We have seen, and the gardening community can testify the fact, all manner of new things and new practice recommended for pine apples, and after three years' ringing the changes upon hot water pipes and sinks, and open gutters,

the same authority holding up to admiration a few specimens as wonders, and ridiculing the idea of all that had been recommended for that period, and boasting of them as having been produced by nothing but dung and good gardening, as though all the expensive means imaginable had been recommended until those who had faith had literally kept their gardeners in hot-water, and adopted all the chops and changes that were proposed, and then as if to expose the folly of perpetually trying novelties, it was determined to show that all this hot-water business was useless.—We have kept free from this course, and we wish to keep so, we have not knowing mentioned a single article that was not from the pen of some one who had succeeded in his practice before he recommended it to be adopted by others. It is something in favour of this work, that some of the best papers in the first four volumes of the *Gardeners' Gazette* have been transposed to our pages, where they have become standard lessons. That among them may be found many very closely imitated by persons who should have been above it, but which it was desirable to place in a standard work of reference for their intrinsic value; and it is not a little gratifying to find that among the numerous would-be critics, who have attempted to cavil at it, the most ill-natured have been unable to fasten upon any thing, but a few typographical errors, not a solitary objector has ventured to impugn a solitary paragraph of practice, or a single lesson of instruction. We can see enough to censure, enough to amend, and seeing it, our object will be to supply the deficiencies, increase the interest, and add valuable features in future volumes. We have endeavoured to keep generally to papers that are in their nature permanent. We have had but little to do with temporary matters, for we know that when we have concentrated the most valuable of the infirmities that lies scattered about in inferior works, and completed in some measure a series of sound fundamental lessons, we may strike advantageously into a new path, and pay more attention to the things of the day; if we have paid more court to one branch of gardening than another, it has been what is called Floriculture, and especially the culture and exhibition of florists' flowers, a branch of the science less and worse treated of by existing works than any other. We may refer with confidence to the treatise on the pansy, the tulip, the auricula, and other florists' flowers as the best of the writings on the subject, and especially to the various papers on the properties of the many subjects that have been of late taken up by floral societies, not only because they have been universally adopted by respect-

able societies, but also by societies who have republished the majority of them, as if they had originally emanated from themselves without the slightest acknowledgment of the source whence they were derived; a compliment to their accuracy, though by no means a respectable mode of appropriating them. We have made no parade of our contributors, though we believe they comprise some of the best practical men in the country; we are content that the matter shall speak for itself, for the writers care nothing about the compliment, and we are too far gone on the road to popularity to care much about the weight of names, nor do we begrudge our new rival, for certain it is we have won his share of public patronage, though he has imitated us more closely than is quite fair, so closely indeed as to add one important (though not a pleasant) proof that there is little room to mind. It is a pity two coaches so much alike should run upon a road where there are no more passengers than one can accommodate.

#### THE MILDEW AND ITS CURE.

FOR many years, no peach walls, or trees in the peach houses, suffered more than those I have now the management of. In some seasons the fruit was scarcely fit for table, and the leaves and young shoots intended for the year ensuing crop covered with a white scurf, entirely preventing the possibility of bloom, I resorted to many supposed remedies. Sulphur was generally the leading feature used in various ways, but all without effect, until I tried the composition I shall now give directions for, which answered my most sanguine expectations in every point. I have heard many opinions on the disease and the causes thereof. Some say it arises from a damp bottom; some from drought; others think it is natural to certain soils, and others to certain situations. I have seen it at all times and under all circumstances, and let it arise from whatever cause it may, I am quite satisfied, from experience, that my specific is a certain preventative.

The preparation is this.—Take one pound of black sulphur, half a pound of soft soap, one ounce of pearl ash, four ounces of Scotch snuff, and about two quarts of boiling soft water. Mix them together in a pan or vessel, well stirring it till cold. This composition must be used in the following way. When you have pruned your peach trees, and either before or after you have nailed them, take part of the composition in a small pot, about the consistency of thin paint: if you find in the first mixing it is too stiff, add a little more water, and with a brush such as is generally

used by painters, dress your trees. Lay it on as if painting, well rubbing it into the old wood; but on the young wood draw your brush always lightly upwards, for if you use it downwards you will damage the flowering buds. Take care to dress the whole of the tree. When the buds are broken and the young shoots grown two or three inches, look carefully over them, and if you see the least appearance of its returning, take immediately

some of the composition, and mix it with water, so that you may use it with a syringe and well wash your trees all over with it, and in a day or two afterwards wash them well again with clean water.

If you find the Mildew inside your cucumber frames or pits, well dress the inside of the brick or wood-work with the same composition, and you will find it beneficial.—JOHN WEEDEN, of *Hillingdon*.



### THE ELM.

ULMUS CAMPESTRIS AND U. MONTANA.

THIS genus occupies a very important place among the trees of Britain, and is distributed over our parks and pleasure grounds in greater numbers even than the oak. Around our palaces, castles, old halls, colleges, and such like time-hallowed places, it is sure to be seen of considerable bulk and of venerable character; and in glancing at the history of this tree as distributed over England, it will be found that more honour has been bestowed upon it than upon any of its brethren. In fact, many of our kings, queens, and nobles have either been planters of it or become attached to it by some other circumstance. It is said that Queen Elizabeth with her own hand planted an English elm at the palace of her father at Chelsea: her name was always associated with it, till some rude hand felled it in the memorable year 1745, and sold it for a pound! At the base of the trunk it was thirteen feet in girth, and its height was 110 feet. A favourite tree of the same illustrious individual still stands at the north-west angle of Richmond Green, which to this day is called "The Queen's Elm." "Some kind hand," Jesse, in his *Gleanings*, observes, "with equal good taste and feeling, has planted ivy round its naked trunk; and

the inhabitants of Richmond, much to their credit, have protected it from injury by surrounding it with a pale fence. The ivy has thriven, and the lately naked trunk is now richly covered with a verdant mantle." From the same authority, it appears that an elm growing near the entrance of the passage leading to Spring Gardens, was planted by the Duke of Gloucester, brother to Charles I. It is said, that whilst that unfortunate monarch was walking with his guards on the morning of his execution, he turned to one of his attendants and mentioned the circumstance, at the same time pointing out the tree. In Hampton Court park there is an elm called "King Charles' swing," which, at eight feet from the ground, is thirty-eight feet in circumference. The date of the planting of Sir Francis Bacon's elm in Gray's Inn Walk (1600), is retained as scrupulously as that of the Restoration; whilst many others, especially of those growing around the palaces at Bushy, Windsor, and Hampton, have been associated with distinguished individuals time out of mind. At Mongewell, in Oxfordshire, there is an avenue formed of the trees of this species, some of which are of an extraordinary size.

Dr. Barrington, when Bishop of Durham, whilst in his ninetieth year erected an urn in the midst of their shade, to the memory of two of his friends, on which the following lines were inscribed :

"In this once favoured walk beneath these elms,  
Where thickened foliage, to the solar ray  
Impervious, sheds a venerable gloom,  
Oft in instructive converse we beguiled  
The fervid time, which each returning year  
To friendship's call devoted. Such things were:  
But *are*, alas! no more."

Those trees on each side of the broad gravel walk in Kensington gardens, near to the palace, are of the English elm; but they are evidently unsuited to their situation, perhaps from their proximity to the water, and present a somewhat stunted appearance. In our own Chapel-field in the city of Norwich, we have tolerable specimens of this tree, some of which are fourteen feet in circumference.

The English elm, then, is fairly entitled to be reckoned one of the most important trees in our English scenes, and more especially in the immediate neighbourhood of buildings.

The *U. campestris* in general may be described as a tall elegant tree, not very striking in its ramification, yet in its outline so uneven and clustering as to render it highly attractive in bright weather, when it displays a variety of light and shade. It is densely clothed with leaves, and these, not in regular series like the beech, but, apparently, at least, in tufts or masses such as painters delight to meet with in such objects. Though generally an upright grower, and maintaining that growth usually within the trunk, we have occasionally seen it in old age diverge into a top of spreading boughs, which, to our ideas, relieves it from the charge of tameness, which some have not altogether unjustly attributed to it.

The *U. montana*, or Wych elm, is much less common in England, and is altogether in its character and habit a grander object. Usually, it has a strong massive trunk, with great boughs extending far on every side, and a broad umbrageous crown. It darkens itself in summer with heavy foliage, so that by many it is reckoned amongst the gloomiest of trees. This character, however, belongs to it principally when growing beside churchyards or deserted buildings, in which case it usually forms a very appropriate accessory. To our ideas, its solemn aspect, rather than a defect, points it out as especially fitting for cemeteries and secluded walks; and, if judiciously employed, even in every seat where depth of shade is required. As a venerable looking object, this tree rivals the oak; and as to its duration, it has few or no competitors. It is plentiful in Scotland, and is generally found around the more

ancient seats there, of great age and beauty. Its chief use in England is for stocks, on which the other species are grafted.

By some unaccountable mistake, Marshall observes, that "there is not, generally speaking, a good elm in the whole county of Norfolk;" a statement which is corrected by Sir J. E. Smith, who says, that the elm of this county makes the best possible timber and sells for double the price of any other, and that it is generally used for naves of wheels, and in the neighbourhood of London for coffins.

Those trees of the elm which we have seen at Cossey, Morton, Weston Old Hall, Holkham, and generally throughout Norfolk, will continue to maintain for our county a name rather distinguished than otherwise for its elms; as, indeed, Sir. J. E. Smith states it to be.

The mode of propagating the English elm is either by layers or grafting: seeds they do not ripen generally. When they are to be set near to ornamental grounds, we should recommend the planting of large trees of those that had been grafted on the Wych elm, because they never send up suckers and generally become handsomer than the other. They are besides of more vigorous growth than layers, and attain ultimately to a greater bulk and age. This tree is well adapted for planting in hedgerows; for being of an upright growth, it overshadows little space under it. Some writers recommend the planting of large trees of the elm, following, no doubt, as a rule, what the Roman husbandmen spoke of and accomplished only as a feat, heightened, too, in the description, by poetical allusion. Evelyn says, that "experience, the best mistress, tells us, that you can hardly plant an elm too big!" "Of all the trees," he continues, which grow in our woods, there is none which does better suffer the transplantation than the elm; for you may remove a tree of twenty years' growth with undoubted success: it is an experiment I have made in a tree almost as big as my waist; but then you must totally disbranch him, leaving only the summit entire; and, being careful to take him up with as much earth as you can, refresh him with abundance of water." Though the elm will suffer to be removed when at a considerable age, the plan here recommended cannot be reduced to practice with any degree of success: generally speaking, no tree should be removed after its tenth or twelfth year.

The Wych or Scotch elm ripens seeds abundantly about the beginning or middle of June. They are usually gathered from the trees, and allowed to dry in an airy loft for a few days previous to their being sown. The soil they delight in is of a light friable nature, and should if possible be in a rich state and free from

weeds. It is altogether unusual to sow tree-seeds in the month of June, so that the treatment of the seedlings, at this season of the year, demands unusual attention. During bright sunshine, the careful nurseryman shades the beds either with branches of trees, mats, or straw; and in the evening, waters them. When the sun goes down they should be exposed to the free air, and when the young plants appear, care is to be taken on the one hand to shelter them sufficiently from the oppressive heat, and on the other, to prepare them by degrees for the approaches of winter. Though this be the rule which strict arborists lay down, it is well known that the elm will outlive all sorts of mismanagement in the rearing of it.

This noble and venerable tree, adding so much to the dignity of our parks and pleasure-grounds, is well entitled to retain a distinguished place in the British Sylva. It is always useful as a park ornament, for its shelter, and for the timber which it yields. Though arborists assign to it "a sound, sweet, and fertile land," and though unquestionably its delight is in such soil, it will attain a tree-like form almost everywhere. It is one of our street trees, stationed generally beside ancient public buildings, and in rows in front of the more antiquated private residences of our gentry throughout all the towns of England. Singularly enough, few young elms so situated are now to be seen; partly we imagine from a decline in taste, from their being a fancied hindrance to commerce, and from the unsightliness, as it is thought, of the rails erected as a protection around young trees. — From *The Eastern Arboretum*, by James Grigor, a work abounding with interesting papers, and most beautifully executed etchings of specimen trees.

#### THE STRUCTURE OF PLANTS.

As plants of all descriptions are connected with the ground by their roots (and in this general insertion we include also those cultivated in pots), it was naturally inferred that they derived their nourishment entirely from the soil; and this, with the more apparent reason, since it was self-evident that the destruction of the roots implied that of the entire plant. But that this opinion was too hastily formed, and without sufficient observation, has been clearly shown by several philosophers, among whom the great Liebig stands pre-eminent. He has demonstrated the truth of that which the experience of every observant gardener must also have confirmed — namely, that *plants, so far from exhausting a soil, add manuring matter to it.* To prove this,

let us go back to first principles, and inquire — what is *earth*? *Loam* is a term of familiar occurrence, though it admits of so many variations as scarcely to be intelligible. However, we may safely assume that when a large proportion of siliceous sand is naturally united with a less proportion of pure clay or alumine, and with certain small quantities of chalk and oxide of iron, the earth resulting from such a combination is, strictly speaking, a *loam*. But what is the origin of such an earth, and whence was it derived? To this inquiry we safely answer that — *the formation* of every particle of laborable earth which now covers the surface of the globe is a process of the disintegration of rocks. On this great primitive operation of natural chemistry, Davy thus expressed himself in his fourth lecture addressed to the late board of agriculture. "It is easy to form an idea of the manner in which rocks are converted into soils, by referring to the instance of soft granite, or porcelain granite. This substance consists of three ingredients, viz., quartz, feldspar, and mica. The quartz is almost pure siliceous earth, in a crystalline form. The feldspar and mica are very compounded substances; both contain silica, alumina, and oxide of iron: in the feldspar there is usually lime and potassa; in the mica, lime and magnesia." In this short passage — which, thirty years ago, was scarcely listened to by the agricultural body — we now find the base, the substance, of all the modern acknowledged theory; and in it we obtain the key to the true philosophy of horticulture. In quartz or rock crystal, we have the origin of sand — a substance which breaks up and modifies the texture of loam, yet in itself is perfectly, or all but, insoluble; *silica* is an oxide of crystal or pure flint. *Alumina* — pure clay and oxide of iron, are also insoluble substances; the former confers tenacity on sandy loams, and renders them plastic; the latter gives colour in all its shades, from pale buff to deep ochreous red. *Lime*, as it exists in earth, is found combined with carbonic acid, and then is neither more nor less than insoluble chalk. As, therefore, the earthy ingredients of loams are portions of rocks broken up by natural agents, no particle of them in their pure state can contribute by any possibility to the organic structure of a vegetable. But the case is widely different when we discover potash among the ingredients of the disintegrated rocks; for in it we discover the base of all those combinations with vegetable acids which are formed in the cellular tissue of a great variety of plants most valuable to man and animals. *Potash* also is a solvent of silica, and by its agency that otherwise intractable substance is conveyed into the structure of the cereal grasses, and of



a variety of other plants. "When," Davy adds, "a granite rock of this kind" (soft granite containing quartz, feldspar, and mica,) "has been long exposed to the influence of air and water, the *lime* and the *potassa* contained in its constituent parts are acted upon by water or carbonic acid, and the oxide of iron, which is almost always in the least oxidized state, tends to combine with more oxygen; and the consequence is, that the feldspar decomposes, and likewise the mica; but the first the most rapidly. The feldspar, which is as it were the cement of the stone, *forms a fine clay*; and the mica, partially decomposed, mixes with it as sand: the undecomposed quartz appears as gravel, or sand of different degrees of fineness. Although it is impossible to enter into any particular details of such operations conducted in the vast laboratory of nature, yet in the foregoing statement we find general truths: these were fully appreciated by Liebig; for we read in his preface, that "since the immortal author of the 'Agricultural Chemistry,' no chemist has occupied himself in studying the applications of chemical principles to the growth of vegetables, or to organic processes. I have," he adds, "endeavoured to follow the path marked out by Sir Humphry Davy, who based his conclusions only on that which was capable of inquiry and proof." Heretofore we find almost all writers attempting to prove that plants derived their support from watery solutions of putrescent—*i. e.* of decomposable matters contained in the ground, and conveyed through the roots into the organic structure. But Liebig—seizing the facts elicited by his great predecessor, examined by repeated and minute experiments the products of vegetables that had been submitted to the action of fire, and thence infers, that—"trustworthy examinations of the ashes of plants of the same kind, growing upon different soils, would be of the greatest importance to vegetable physiology,"—and so it has happened;—for now, instead of insisting any longer upon the old theory, we find all our best practical writers devoting their attention to the *inorganic* constituents of plants, which constituents are traceable in the ashes left after incineration. By these inquiries we arrive at a simple and determinate system of manuring, and are enabled to reconcile apparent inconsistencies, for they instruct us that no substances whatsoever can enter the plant through the infinitely minute tissue of the roots, excepting those which are absolutely soluble in the water of the soil, and such substances are potash, certain combinations of phosphoric acids, neutral salts, and electro-chemical combinations of *carbon*;—but to recur to Davy. "As soon as the smallest layer of earth is formed on the

surface of a rock, the seeds of lichens, mosses, and other imperfect vegetables which are constantly floating in the atmosphere, and which have made it their resting-place, begin to vegetate; their death, decomposition, and decay, afford a certain quantity of organisable matter, which mixes with the earthy materials of the rock; in this improved soil more perfect plants are capable of subsisting; these, in their turn, absorb nutriment from the water and the atmosphere, and after perishing afford new materials to those already provided; the decomposition of the rock still continues, and at length, by slow and gradual processes, a soil is formed in which even forest trees can fix their roots, and which is fitted to reward the labour of the cultivator." It has always been supposed that the decay of vegetable matter within the soil was the precursor of vegetable nutriment; in a word, that it prepared the crude sap, and contained all the elements of the vegetable structure. It has, however, been the glory of modern science to prove that not a particle of decaying matter is taken from the soil: on the contrary, that vegetable substances—*humus* and the *base of carbon*, are constantly added to, and accumulated in, ground under crop. A writer, (Dr. Fownes,) author of the Prize Essay on the Food of Plants—in the Journal of the Royal Agricultural Society—thus expresses himself: the quotation is substantially the theory of Liebig:—"Examine the soil in which trees grow from year to year," (as, for instance, in a pine forest of barren sand, like that of the Landes of Bourdeaux,) "and note its constantly *increasing richness in humus*—in vegetable matter. Far from exhausting the soil in this respect, these trees pour out constantly from their rootlets matter containing carbon, which, by decay in the soil, becomes humus. The dead leaves, and small branches accidentally broken by the wind, accumulate beneath and add to this store of humus"—"whence did these trees obtain their carbon? The earth did not yield it: it must have been the air. To ascribe the origin of the carbon of plants in a state of nature to the absorption of humus from the soil in which they grow, is about as reasonable as to suppose the possibility of a race of animals subsisting on their own *offspring*. That substance is a *product of the decay of previously existing plants*, and which must have got their carbon from some other source. Its quantity, moreover, increases every year; and if this latter fact is not true with respect to some cultivated soils, it is easy to see the reason in the greatly accelerated destruction of the substance by the oxygen of the air, brought about by the constant loosening of the soil; add to this the slight degree of solubility possessed by

humus itself, or of the so-called 'humate of lime,' and it is easy to see its total inadequacy to supply even a small part of the carbon fixed in a growing plant." Enough of quotation to prove the advance of science; but our authorities yet lack an active operating first cause; they neglect, or do not perceive, the boundless energy of the elementary fluid, termed electricity, the bond of all chemical union—the agent of all attraction, and of gravitation itself. We shall show this more clearly in our closing article on Manures: but in our present position it may suffice to state that the crude sap contains all those substances which are directly soluble in water—that is to say, the salts of all kinds which are found, either simple or compounded, with acids, having alkaline or earthy bases. Carbon can only enter the roots in the form of carbonic acid, or of some hydro-carbon; but as these combinations are always gaseous—the direct result of electric divellent agencies—we incline to believe that they pass off into the atmosphere and then enter (according to the nature and wants of the individual plant) the stomates of the leaves. The opinion of Mr. Paxton rather coincides with our own, as to much more being taken from the atmosphere than chemists give credit for.

#### THE DAPHNE.

ONE of the sweet-scented flowering shrubs, of which there are many kinds. The species are, 1. *Daphne Laureola*, commonly called *Spurge Laurel*. 2. *Daphne Mezereon*, commonly called *Mezereon*. 3. *Daphne Thymelæa*. 4. *Daphne Tarton-raire*, commonly called *Tarton-raire*. 5. *Daphne Alpina*. 6. *Daphne Cneorum*. 7. *Daphne Gnidium*. 8. *Daphne Squarrosa*. 9. *Daphne Americana*. The first, (*D. Laureola*) is a low evergreen shrub, which rises with several stalks from the root to the height of two or three feet, dividing upward into several branches, with spear-shaped leaves, which come out irregularly on every side, smooth and green; between these, towards the upper part of the stalks, come out the flowers in small clusters; they are of a yellowish green, and appear soon after Christmas, if the season is not very severe; these are succeeded by oval berries, which are green till June, when they ripen and turn black, soon after which they fall off. It is an evergreen, and will thrive under tall trees. The second sort, *D. Mezereon*, is from Germany, and it grows in some woods near Andover in Hampshire. This has been long cultivated in the nursery-gardens as a flowering shrub, and is a very ornamental plant in gardens, very early in the spring, before others make their

appearance. There are two distinct sorts of this, one with a white flower which is succeeded by yellow berries, the other with peach-coloured flowers and red fruit. There is a variety of the peach-coloured *mezereon*, with flowers of a much deeper colour than the common, but these vary in their colours when raised from seeds. This shrub grows to the height of five or six feet, with a strong woody stalk, putting out many woody branches on every side, so as to form a regular head; the flowers come out very early in the spring, before the leaves appear, growing in clusters all round the shoots of the former year; they have a very fragrant odour: after the flowers are past, the leaves come out, which are smooth, spear-shaped, and placed without order; the flowers are succeeded by oval berries, which ripen in June; those of the peach-coloured flowers are red, and those of the white, yellow. The flowers appear in February and March, and sometimes in mild winters they appear in January. Seeds should be sown in a border exposed to the east, soon after the berries are ripe. When the plants come up they will require no other care but to keep them clean from weeds, and if the plants are not too close together, they may continue in the seed bed, to have the growth of two summers; when the leaves are shedding, the plants should be carefully taken up and planted in rows, sixteen inches from row to row, and eight or nine inches apart in the rows; they may remain here two years, by which time they will be fit to remove to the places where they are to remain for good: the best season to transplant is in autumn. These plants grow best in light sandy earth, for in cold wet land they become mossy, and make little progress. There are some of this and the former sort, with variegated leaves, but the plain are much more beautiful and healthy. The third, *D. Thymelæa*, was introduced from Spain, Italy, and the south of France, where it rises to the height of three or four feet, with a single stalk covered with a light-coloured bark; the flowers come out in clusters on the sides of the stalks, but make but little appearance being greenish. The fourth sort, *D. Tarton-raire*, grows naturally in the south of France. It is a low shrubby plant, which sends out several weak stalks from the root, a foot long, and spread about irregularly; these are tough and stringy, covered with a light bark; the leaves are small, are very soft, white, and shining like satin; between these the flowers, which are white, come out in thick clusters from the side of the stalks in June. The fifth sort, *D. Alpina*, is from Geneva, and grows in other parts of Italy, where it rises about three feet high; the flowers of this come



out in clusters from the side of the branches, early in the spring. The sixth sort, *D. Cneorum*, grows naturally on the Alps, as also upon the mountains near Verona; this is a very humble shrub, seldom growing more than one foot high, with ligneous stalks, which put out several side branches, which are terminated by small clusters of purple flowers, which stand erect, having no foot-stalks; the tubes of these flowers are longer and narrower than those of the mezereon, and the mouth is cut into four acute parts which are erect. The seventh sort, *D. Gnidium*, is from Montpellier; this rises with a shrubby stalk about two feet high, dividing into many small branches, the ends of which are terminated by panicles of flowers, which are much smaller than those of the mezereon, having swelling tubes, which are contracted at the mouth. These appear in June. The eighth sort, *D. Squarrosa*, is indigenous to the Cape of Good Hope; this shrub rises to the height of five or six feet, dividing upward into several branches, which grow erect, and are covered with a white bark, with small narrow leaves, which come out on every side of the branches without order, spreading open; the tops of the branches are terminated by woolly heads, out of which the flowers come in small clusters; they are white, having oblong tubes. The ninth sort, *D. Americana*, grows naturally in the West Indies. This shrub rises to the height of four or five feet, with a woody stalk, covered with a rugged bark of an ash-colour; the upper part of the branches have leaves about the size and the same form as those of Rosemary; between the leaves the flowers come out in small bunches, upon foot-stalks an inch long; they have short tubes cut into four parts at the top, and are white; these are succeeded by small round berries, of a brown colour when they are ripe. The third, fourth, and seventh sorts are hardy, so will live through the winters in England in the open air, provided they are in a dry soil and a warm situation. The fifth and sixth sorts are as hardy as the common mezereon, so are not in danger of being hurt by frost in England; but they are all very difficult to keep in gardens, because neither of them will bear to be transplanted, and must be sown where they are to stand. They may have only the morning sun, they will thrive better than in a warmer situation, and the ground near the roots of these should not be disturbed. The fifth sort is a beautiful sweet shrub, so deserves a place in gardens, as much as any of those we cultivate for ornament. The spurge laurel is used to graft the varieties of daphne and laurel on; and, besides this, it is a useful low evergreen. The flowers are insignificant. In the evenings they emit a beau-

tiful odour. *Daphne Cneorum* is one of the most beautiful of dwarf shrubs, and this shrub generally is in request, both the half-hardy and the hardy sorts. The culture given for *Daphne Mezereon* will do for the rest; but, all of them propagate from layers which are pegged down in the autumn, and taken off the year following.

#### CYTISUS.

OF this beautiful tribe the principal varieties are—1. *Cytisus Laburnum*, commonly called Laburnum; 2. *Cytisus Alpinus*, commonly called long-spiked Laburnum; 3. *Cytisus Nigricans*, or black smooth *Cytisus*; 4. *Cytisus Sessilibus*, commonly called by the gardeners, *Cytisus secundus* Clusū; 5. *Cytisus Hirsutis*, commonly called hairy, or evergreen *Cytisus* of Naples; 6. *Cytisus Argenteus*; 7. *Cytisus Supinus*; 8. *Cytisus Austriacus*, commonly called Siberian *Cytisus*; 9. *Cytisus Æthiopicus*; 10. *Cytisus Græcus*; 11. *Cytisus Cayan*, commonly called Pigeon Pea in America. The first sort is the common broad-leaved Laburnum, which was formerly in great plenty in the English gardens, since the second sort was introduced, it has almost turned this out; the spikes of flowers being much longer, they make a finer appearance when they are in flower, but the first grows to be the largest tree, the wood of it is hard, of a fine colour, and will polish very well; it is by the French called Ebony of the Alps, and is there used for many kinds of furniture. His Grace the Duke of Queensbury sowed a great quantity of the seeds of this tree, upon the side of the downs, at his seat near Amesbury, in Wiltshire, where the situation was very much exposed, and the soil so shallow, as that few trees would grow there; yet in this place the young trees were twelve feet high in four years' growth. Both the first and second sorts are easily propagated by seeds, which the trees produce in great plenty. If these are sown upon a common bed in March, the plants will appear by the middle or end of April, and will require no other care but to be kept clean from weeds during the following summer; they may be transplanted the autumn following, either into a nursery, where they may grow a year or two to get strength, or into the places where they are designed to remain; where people would cultivate them for their wood, it will be the best way to sow the seeds upon the spot where they are intended to grow, because these trees send out long, thick, fleshy roots to a great distance, which will penetrate gravel or rocks; and if these roots are cut or broken, it greatly retards their growth. When they are not sown

upon the intended spot, they should be transplanted young, or they will not grow well where they are only designed for ornament, the removing the plants twice will stop their growth, and cause them to be more productive of flowers; if the seeds are permitted to scatter in winter, the plants will rise in great plenty the following spring, so that a few trees will soon supply a sufficient number of the plants. The Laburnum flower in May, at which time they make a fine appearance, their branches being loaded with long strings of yellow flowers, which hang down from every part. The seeds grow in long pods, which ripen in autumn. There is a variety of Laburnum with variegated leaves, but the seeds of these will produce plants with green leaves; the same as the seeds of variegated holly; cuttings should be planted in autumn, when the leaves begin to fall, if you want to propagate the variegated kind, the plants must have a poor soil, for in good ground they are apt to become plain. The second sort differs from the first, in having narrower leaves, longer bunches of flowers, and the trees do not grow so large and strong; this difference is constant from seed. There is another sort mentioned by Tournefort, with shorter bunches of flowers than either of these, but it was only a seedling variety. The third sort grows naturally in Austria, in Italy, and Spain, and seldom rises more than three or four feet high in England; it naturally puts out many lateral branches near the ground, which spread out on every side, so as to form a low shrubby bush: the branches are very slender, and their ends are frequently killed if the winter is severe; these fresh oblong oval leaves, growing by three on each foot-stalk; they are equal in size, and of a dark green colour; the branches grow erect, and are terminated by spikes of yellow flowers, about four or five inches in length, standing upright; it flowers in July, after most of the other sorts are past, and the seeds ripen in autumn. This is propagated by seeds, or grafting on the Laburnum. Sow in March, or in the beginning of May, the plants will appear, when they must be constantly kept clean, which is all the culture they require till autumn, in frosty weather the plants must be covered with mats, to prevent their tender shoots from being killed. The spring following, after the danger of hard frost is over, the plants should be carefully taken up, and planted out at the distance of one foot, row from row, and six inches asunder in the rows; this should be in a sheltered situation, they need not be transplanted before the end of March, or the beginning of April; and if the season should prove warm and dry, give

the plants some water to settle the earth to their roots; if the drought continue, the waterings must be repeated at a week's interval from each, it will be of service to the plants. The plants may remain two years, when they will have strength enough to be transplanted where they are to remain. The fourth sort *C. Cessilibus* grows naturally in the south of France, in Spain, and Italy, but has been long cultivated in the nursery gardens, as an ornamental flowering shrub, by the title of *Cytisus secundus* Clusi. This rises with a woody stalk, putting out many branches which are covered with a brownish bark, oval, small leaves, growing by threes on very short foot-stalks. The flowers are bright yellow, and are produced in close short spikes at the end of the branches, standing erect, and appear in June; these are succeeded by short broad pods, which contain one row of kidney-shaped seeds, which ripen in August. These will rise to seven or eight feet, and become very bushy; they are very hardy and will thrive in any situation, and upon almost any soil, which is not too wet. They are propagated by seeds or grafting and may be sown upon a common bed of light earth in the spring, and in autumn the plants may be transplanted one foot apart, and at six inches distance in the rows, where they may remain two years, and should then be removed to the places where they are designed to grow. The fifth sort, *C. Hursules*, has a soft shrubby stalk, dividing into many branches, which grow erect, and frequently rise to the height of eight or ten feet; the stalks and leaves of this are very hairy; the leaves are oval, growing three upon each foot-stalk, the flowers come out from the side of the stalk, in short bunches, they are of a pale yellow, and appear in June; these are succeeded by long, narrow, hairy pods, with one row of kidney-shaped seeds, which ripen in September. This has been much cultivated in the nursery gardens, by the title of *Evergreen Cytisus* of Naples; but as they are rather tender and must be planted on a dry soil, and a warm situation, they are also very difficult to remove, when grown to any size, for they shoot long tap roots deep into the ground, and when these are broken or cut, the plants seldom survive it. This may be propagated as the third sort. It grows naturally in the south of France, in Spain and Italy. The sixth sort, *C. Argentius*, has herbaceous stalks, and woolly leaves; the flowers are produced sometimes single, at other times two, three, or more grow together at the end of the branches in June, and are succeeded by hairy pods. It is propagated by seeds, as is directed for the third sort. The seventh sort, *C. Suspinus* grows naturally in Sicily,

Italy, and Spain; this is a perennial plant, whose weak branches trail upon the ground, and extend to the length of eight or ten inches; with oblong leaves, placed by threes upon pretty long foot-stalks; they are hairy on their under side, but smooth above: the flowers are collected in heads at the end of the stalks, having a cluster of leaves under them; they are of a deep yellow colour, and appear the latter end of June, and in warm seasons these are succeeded by flat woolly pods, containing one row of small kidney-shaped seeds, which ripen in September.—This plant is propagated by seeds, which should be sown where the plants are to remain, and should be treated in the same manner as the third sort. The eighth sort, *C. Austriacus*, grows naturally in Tartary. It has a shrubby stalk, near four feet high, dividing into many branches, which, when young, are covered with a green bark and smooth leaves; the flowers are produced in close heads at the end of the branches, having a cluster of leaves under them; they are bright yellow, and appear in the beginning of May; this is propagated by seeds, which should be sown early in April, on a border of strong ground exposed to the east; this requires a cold situation and a pretty strong soil, otherwise it will not thrive. The ninth sort, *C. Ethiopicus*, grows naturally about Algiers, this rises with a soft shrubby stalk to the height of eight or ten feet, putting out many slender branches on every side, with small wedge-shaped leaves, indented at the top, of a dark green colour and smooth; the flowers come out frequently single from the side of the branches, these are large and of a bright yellow; they appear in June. This sort is too tender to live in the open air. The tenth sort, *C. Græcus* grows naturally in the islands of the Archipelago; it rises with a ligneous stalk six or seven feet high, sending out many angular lateral branches, with single, narrow, spear-shaped leaves; the flowers are produced in short bunches from the side of the branches, they are small, yellow, and appear in July and August. This is propagated by cuttings, which if planted on a bed of light earth the beginning of July, and are closely covered with a bell or hand glass, which should be shaded from the sun in the middle of the day, they will put out roots by the middle or end of September, when they should be carefully taken up, planting each in a separate small pot, carefully watering and shading them until they have taken new root, after which they may be exposed in a sheltered situation till the end of October, when they must be removed into shelter, for this plant is too tender to live in the open air in England. The

eleventh sort, *C. Cayans* grows naturally in America, and also at the Cape. This rises with a weak shrubby stalk eight or ten feet high, sending out many erect side branches, with spear-shaped woolly leaves, placed by threes, the middle lobe having a longer distinct foot-stalk than the two on each side which grow close to the principal foot-stalk.—The flowers come out from the sides of the branches, sometimes single, at other times in clusters; they are of a deep yellow colour, and about the size of those of the common Laburnum; these are succeeded by hairy pods about three inches long, which are sickle-shaped, ending with a long acute point, swelling at the place where each seed is lodged; the seeds are roundish, inclined to a kidney-shape. These seeds are esteemed an excellent food for pigeons in America, from whence it had the title of Pigeon Pea. This plant grows only in a warm stove. It rises easily from seeds in a hot-bed, and will grow three or four feet high the first year, provided they have a proper heat, and the second year they will produce flowers and seeds. The plants must be placed in the bark-bed in the stove, and treated in the same manner as other stove plants.

[Independently of these and their hybrid varieties, we have some of the family of Spartiums added to the Cytisus, for instance Spartium Multiflorum is now *C. Albus*, with white flower. Spartium spensum is *C. Laniger*, Spartium nubicenium is *C. Nubigenus*, Spartium patens is *C. Patens*, Spartium spinosum is *C. Spinosus*, and Cytisus purpureus is a hardy species blooming in June. The chopping and changing of names adds greatly to apparent varieties, and there are in this tribe like many others, too many alike. Yellow and white predominate, and one of the best for its scent and appearance, is Cytisus racemosus, which is said to be hardy, though we doubt it. Most of the Cytisus, however, are hardy, and will graft on the common Laburnum, forming choice standard shrubs at all the nurseries.—It will be seen, that although there is some trifling difference in the culture of the more delicate species as compared with the ordinary Laburnum, the management is very simple. The Purple laburnum as it is called, is supposed to be only a sport from the yellow, and particularly as there have been purple flowers even among yellow ones on the common tree, and yellow flowers among the purple ones, on the Purple Laburnum, a variety improperly called scarlet.]

#### GUANO.

According to the analysis of Voelckl, natural guano consists of—

Urate of ammonia.....	9.
Oxalate of ammonia.....	10.6
Oxalate of lime.....	7.0
Phosphate of ammonia.....	6.0
Phosphate of ammonia and magnesia.....	2.6
Sulphate of potash.....	5.5
Sulphate of soda.....	3.8
Muriate of ammonia.....	4.2
Phosphate of lime.....	14.3
Clay and sand.....	4.7
Undetermined organic matter, ( $\frac{1}{3}$ of which is soluble in water, and water with traces of soluble salts of iron.....	32.3
	100.

Composition of American artificial Guano, with an estimate of the cost of each ingredient, by a scientific and manufacturing chemist. The prices are estimated for crude products, as they can be made in large quantities:—

	Cost per lb.		Total.	
	lbs.	cents.	cents.	
Bone-ash, or ground bones...	15	$\frac{1}{2}$	7	
Carbonate of ammonia.....	10	6	60	
Phosphate of soda.....	10	4	40	
Sulphate of magnesia.....	6	3	18	
Muriate of ammonia.....	5	9	45	
Sulphate of soda.....	3	1	3	
Sulphate of potash.....	5	3	15	
Nitrate of soda.....	5	4	20	
Nitrate of potash.....	2	6	12	
*Humate of potash.....	20	3	60	
†Apocrenate of ammonia, &c.	10	4	40	
Oxide of manganese.....	5	2	10	
Bog-iron ore in powder.....	2	1	3	
Fine silex from peat bog, q.s.				
	100		\$3 32	

In the cultivation of potatoes, a much larger proportion of sulphate of magnesia may be introduced with advantage. For clover, a very large addition of gypsum may be made, either by mixing it directly with the Guano, or by spreading it on the soil, the latter being preferable, since it will absorb the escaping ammonia.

The apocrenate, cronate, and humate of ammonia made by the addition of carbonate of ammonia to swamp muck or peat, does not (in the large way) require to be dissolved and filtered. It will be sufficient to mix them in the state of moist paste. No ammonia can

escape from its combination with the peat or muck.

The refuse bone-black of sugar refineries may be made into a paste with sulphuric acid in excess, and then treated with a sufficiency of crude potash or soda to take up the phosphoric acid set free by the sulphuric acid. This mixture may be at once added to the other ingredients of the Guano, leaving out the phosphate of soda and sulphate of potash and gypsum, for these are now formed.

The animal carbon will also be a substitute for the ammoniacal extract of peat, which may be omitted. Urine made into a paste with calcined gypsum, may be substituted for the carbonate and muriate of ammonia. It is indifferent whether we use nitrate of soda or potash. The common crude saltpetre will answer perfectly well, where it can be obtained cheaper than nitrate of soda. Common bog manganese answers for the oxide of manganese and bog iron.

It will be easy for any one familiar with chemistry, to make many varieties of the above combinations within the rules, but those who do not understand the science, will do well to follow the formula strictly, if they wish to test the value of the manure.

#### NOTES ON A FEW SELECT CARNATIONS AND PICOTEEES IN A LIMITED COLLECTION.

In justice to the author of the following list of carnations and picotees, published in a cotemporary work, and of which we complained on account of the small number which it comprises, we give it entire, with a notice from the writer that they were taken from a limited collection only, and that he only pretends to give his notes on those he thought worth describing.

*Scarlet Bizarres.*—The *furor* that was excited by Twitchett's *Don John*, a couple of years ago, has subsided, and notwithstanding that the raiser has obtained all the prizes in its class within this year at Cambridge, I consider it a very uncertain flower, having seen many blooms of it this year, and hardly one perfect one. Shading does not suit it, for then the petals do not expand sufficiently; and if in the sun, its very brilliant colour is apt to run. It is, however, a variety worth possessing, and may perhaps get more steady as it grows older. Martin's *Splendid*, in colour a rich brownish scarlet, deserves the name; but its growth is very bad, not rising more than eighteen inches in the flower stem, and the foliage scanty and dwarf. Hence, perhaps, it maintains its high price longer than other varieties. Ely's *Lord Pollington*. Pod good, colour good also, and,

\* Sawdust and potash melted together in an iron pot.

† Peat steeped in carbonate of ammonia, strained and evaporated to paste.

like all of Ely's flowers, opens well and flat. Smith's Duke of Wellington. A large bright-coloured flower, pod good, luxuriant in its growth, and a very desirable variety. To these may be added, Ramsforth's Game Boy, and Fletcher's Duke of Devonshire.

*Crimson Bizarres.*—Puxley's Prince Albert. An uncertain flower, rather faint in colour, but large, and a desirable variety, though eclipsed, I think, by that fine old variety, Cartwright's Rainbow. A good flower, bright in colour, but rather hard to grow well. Wood's William IV. I have had blooms on this root, which I have not seen equalled by any other. The guard petals are large, round, and well shaped; the stripes good, the white clean, and altogether it is with me a favourite flower. Gregory's King Alfred, Holmes' Count Paulini, and Ely's Lord Milton, will complete a very good half dozen.

*Purple Flakes.*—In this, as well as in the other classes of flakes, I cannot speak from actual examination, not growing many; but the following may be relied on:—Ely's Mango. This I grow; it is a fine richly-coloured well-podded flower; but comes very early into bloom, and it will require some skill to keep it back for its fellows. Leighton's Bellerophon. This I grow also; an old variety, but very good. It was in the winning stand at "The Coppice" this year. Brabbin's Squire Meynell, ex. ex. Mansley's Beauty of Woodhouse. A very fine flower; can hardly be beaten in its class. Pollard's First Rate, is first-rate, and with Sharp's Esther, will complete a half dozen that cannot be beaten.

*Scarlet Flakes.*—Six good ones. Chadwick's Brilliant, Bucknall's Ulysses, Addenbrook's Lydia (old but good), Wilson's William IV., Wigg's Earl of Leicester, and Toone's Ring-leader.

*Rose Flakes.*—Ely's Lovely Anne, Ely's Lady Ely, Brook's Flora's Garden, Greasley's Village Maid, Tomlyne's Bissis, and Wilson's Harriet.

*Piccotees.*—Here I can better give my opinion, as they are greater favourites with me than carnations; and any observations I may make on them may be relied on, as far as they go, for they are unprejudiced, here (Dublin) there is no contention about midland, northern, or southern flowers. We pick and cull from all; and while we think some of the Lancashire flowers absurdly thin, we do not deny but that many of the London flowers have too much stuff. Beautiful flowers, no doubt, come from both places, and I trust they will yet outdo all they have effected, great as that undoubtedly is, not that I agree with a taste too prevalent here of classing large-sized flowers first. Shape I consider a far greater point—large, well-

formed, guard leaves, and the others imbricated regularly on them, with a good crown.

*Heavy-Edged Red.*—Barraud's Cornelius. Undoubtedly a noble flower. The edging is very high-coloured, a brilliant red; the petals large and well shaped, the white pure, and the colour keeping well to the edge. The habit of the plant is good; but, to my taste, the flower is a *little* too thin, as it does not crown well: still it is a very fine flower, and indispensable to a grower of this lovely tribe. Brook's Duchess of Cambridge. A pretty flower, novel in colour, a bright red, white good, opens well, and altogether a neat flower. Gidden's Sir R. Peel. A very striking flower, the colour an intense red, almost black. The habit of the plant is not good, nor do I think it a first-rate flower, though worth growing for contrast's sake. Brinklow's Masterpiece. Mr. Dickson, of Brixton, the eminent grower of carnations and piccotees (to whom I would recommend all persons desirous of being well treated, and liberally and fairly dealt with, as they are sure of having fine, strong, healthy plants true to name, and every advantage given them), says in this year's catalogue, as published in the *Gardeners' Gazette*, that this variety is the same as Gidden's Teazer. I cannot think he is right. Teazer has always been here a difficult plant to grow, whereas Masterpiece is a very free grower. The colour of the latter, too, is higher, and the flower fuller. I may be wrong, but this is my view of the matter. *Sharpe's Duke of Wellington*, were it not for its pudding-shaped pod, which makes it very liable to burst, this would be the best heavy red out, as it is, if caught, a very pretty flower, round in its shape, good in its colour, and deserving a place in any collection. Mitchell's, *alias* Mansley's *Nulli secundus*, a northern flower, consequently thin, but deserving of its name, possessing as it does all that constitutes a first-rate show flower; white good, edging heavy and well defined, and the shape excellent. A few more petals would be decidedly an advantage and improvement, but altogether it is really *Nulli secundus*. Sharpe's Invincible. Another ex. ex. flower, with more stuff than the last-named. Though perhaps not quite equalling it in other respects, still a desirable variety.

*Purple-Edged, Light.*—Brinklow's Purple Perfection. A first-rate flower. Mr. Dickson says, the best in its class, and he is no mean authority. The pod is rather short, but the flower altogether is a first-rater. Brinklow's Lady Chesterfield. A very pretty flower; the edging very light and delicate, the white pure, and shape good. Its habit is rather delicate, but a most desirable variety in other respects. Gidden's Vespasian. Another most excellent flower, deserving of a place in the smallest col-

lection, possessing nearly every property of a first-rate flower. John's Prince Albert. Decidedly, to my taste, the best in its class I have yet seen. The edging is not very light, the shape is good, the white beautifully pure—habit good, and altogether a superb flower. Wilson's Pluperfect. An old flower, but a good one; the edging light and delicate, white good, rather difficult to increase, as its habit is not robust. Wood's Lord Hinchinbrook. A good variety, well worth growing, pod good, white pure, shape ex.

*Rose-Edged, Heavy.*—Green's Queen Victoria. This, and the two varieties next named, are most beautiful flowers, possessing most of the qualities desired to constitute a first-rate flower. They are sorts that, no one who grows this (to my mind the most beautiful of all the classes of piccotees) class, can possibly do without. The one first named is, however, decidedly the best of the lot, and nothing in the whole range of piccotees can exceed a well-bloomed, clean-grown flower of Green's Queen Victoria. Kirtland's Squire Annesley. Another most beautiful flower; its growth is its only fault, and that arising from its great luxuriance. Lovegrove's Seedling, No. 5. Another fine flower, apt to burst its pod; but if this is watched, will well repay any care bestowed on it. Twitchett's Fair Rosamond. A fine flower, wants a few more small petals to make a better crown; but, with all this, it is a sweet variety. Wilson's Miss Fanny Irby. A pretty scarlet-edged flower, raised by the Hon. and Rev. Robert Wilson, raiser of Harriet, Pluperfect, &c. Sykes' Eliza. A fine flower, old, but possessed of qualities deserving of its being continued as a favourite. Well and judiciously opened, it is equal to any of the reds in cultivation, being a large, full, and well-shaped flower. Wildman's Isabella. A very splendid flower, the colour a bright cherry red, the white most pure, the petals large and well shaped, not too full, opens well, and is most distinct. A variety that ought to be grown in every collection. Orson's Adelaide and Jessop's Sir William Middleton, I do not know, though they have been in the winning stands about London this year; so suppose they must be good.

*Light-Edged, Red.*—Brinklow's Duchess. A tolerably good flower, but with a disposition to bar, and I hope the day is not far off when we shall get flowers that keep their colour well to the edge. As flowers go now, this is an acquisition to any collection. Burrough's Joan of Arc. A large, full, good-looking flower, not exactly a first-rate show flower, the edges not being quite even, still a variety that must please. Burrough's Mrs. Bevan. A first-rate show flower. Kirtland's Duke of Wellington. Pod good, white clean, and the colour well confined

to the edge; a first-rate show flower, and, like most of this raiser's, has plenty of stuff. Sharpe's Hector. Another good flower; the white is waxy, edging good, and the habit of the plant most luxuriant. Should be grown by every one who has even only a small collection. Wood's Queen Victoria. An old variety; but, in my opinion, very superior to many now in cultivation. It possesses many of the properties of a first-rate flower, and I was glad to see it taking its place in the winning stands at the great Coppice show this year.

*Heavy-edged, Purple.*—Crask's Queen Victoria. I put this first in this class; for, though rather thin, there are few, if any, that come up to it. The white is pure as snow, the purple good, and belts the edges well, not running down into the petals at all. Being a thinnish flower, it opens well too. The petals are large and well shaped, and in many points it cannot be excelled. Dickson's Trip to Cambridge. A very fine variety; would be better if the guard leaves were larger; as it is, however, it is a very fine flower. There are other flowers sold under the name, so I would advise amateurs to go to head quarters for it—Dickson, Acre Lane, Brixton. Gidden's Miss Hennell. A very tall young lady she must be, for the plant throws up a flower stem nearly four feet high, which is decidedly a disadvantage. The foliage is not pleasing, the flower is, however, a good one, not equal to the two already named, but still a good variety. Kirtland's Princess Augusta. A flower in its growth the very opposite of the preceding, being more like a pink, so short and small is it. It is, however, a variety deserving attention.

*Light-Edged, Rose.*—Barnard's Mrs. Barnard. The finest light-edged rose in cultivation, the merits of this flower, and its relative value to two other fine varieties, Dickson's Bride, and Lady Alice Peel, are so well described in your August number that I will not record my own, as I believe those of your correspondent were true; there are some new flowers in this class, but I must confess to not having seen them, so my observations would be of no service. Waine's Queen Victoria, a pretty flower, but has a pudding-shaped pod that prevents its opening well, but of those that I have seen it is not the worst. With these observations I now conclude; my time is so much occupied in my professional pursuits, that I have been unable to forward this before, and even now it goes forth in a crude and hasty form, wishing your excellent little periodical every success.—H. H. D. Bray, Ireland, 1844.

We trust the author is now satisfied that we have placed his list fairly before our readers. If we condemned we knew nothing about who we were condemning, we only know that as *The*

*Florist's Journal* affected to give good information, and its readers would naturally be guided by it, there was a necessity to step forward and vindicate the flower against any supposition that the variety was so small, for people would naturally infer, in the absence of in-

formation to the contrary, that these were all worth notice simply because they were all that were noticed; whereas, the limited number, now that it is explained, arises from the smallness of the collection generally grown in Ireland.



RHODODENDRON CAMPANULATUM.

We raised this beautiful plant in 1825, from seeds. It is a native of Nepal, and grows, as we are informed by Dr. Wallich, in elevated situations, so that he had no doubt of its bearing our winters uninjured. This has been confirmed by actual experience during the two last seasons, in which several plants remained perfectly well out of doors with us. The young leaves are at first purplish underneath; they then become milk white, and afterwards, when quite hardened, change to

a kind of tan colour. It flowered with us in April, kept in a cold frame.

We have succeeded in propagating it by layers, as well as by cuttings. The soil should be loam and peat.

Few plants are so magnificent in flower as the Rhododendrons; few also are so widely diffused over the globe, though none have yet been found south of the Equator.—*Loddiges' Botanical Cabinet*, 1833.

#### LANDSCAPE GARDENING IN AFRICA.

SIR THOMAS DICK LAUDER, in his "Essay on the Origin of Taste," and whilst, like Dr. Syntax in search of the Picturesque, breaks out with reference to England and her cultivators with the following piece of advice:—"For, rich as these happy islands of ours are in natural scenery, and much as has been done within them by the hand of man to aid and embellish nature, no one possessed of good taste in Landscape Gardening can travel throughout the length and breadth of our land, without being satisfied that much remains to be done, and, perhaps, not a little to be undone. Let me, then, earnestly call upon all such highly privileged individuals as have landed estates, and sufficient means to enable them to embellish

them, to bear in mind, that amongst the many duties which in reason and justice appear to be entailed upon them by the very circumstance of their being the lords of a portion of their native soil, that of their obligation to contribute to the general improvement of the face of the country is not to be neglected. And, as this can be effected solely by the exertions of individuals, each in his own particular sphere, every landed proprietor is bound, as far as his subject will admit of it, or his means allow him, to do all in his power to bestow upon his possession, whether it be small or whether it be great, the fullest enrichment of which good taste would pronounce that its features may be capable. He can have little feeling for his

country who does not admit the truth as well as the importance of this view of the matter, in which no account is taken of that exquisite self-gratification which every one devoted to the practical pursuits of Landscape Gardening must reap from the most delightful as well as most innocent and rational of all rural employments—a self-gratification, be it remembered, which cannot be indulged in without producing effects that must give the widest pleasure to all the rest of mankind who may have an opportunity of looking upon them, not only in our own time, but for generations to come. Indeed, it is natural for every Briton to feel a sort of national, if not an individual appropriation, in all the finest and most remarkable places, which, as it were, belong to the nation. Every actual proprietor, therefore, ought to feel that the eyes of his country are upon him and upon his place—that, in fact, he holds it for his country—and that, farther, the tenure by which he holds it is that of an obligation to do all for it that industry, guided by the best taste, can effect, to make it a feature worthy of British Landscape.” Say you so, Sir Thomas Dick? then take a berth in the first balloon or steamer that sails to Africa, and visit the Cape of Good Hope, and try if you can infuse a little of your spirit and *taste* into the minds of the natives, for they are “a’ noddin, nid nid noddin,” as it regards matters either of improvement or embellishment. We know not whether it be a want of time, money, labour, or inclination; whether the desire to fill the coffers or the stomach be greater than a disposition to ornament or enrich the soil; whether the merchants, and men of business, have been wholly absorbed in pushing the interests of trade and commerce, and enforcing a sale of the produce of the loom, rather than the fruits of the earth; but it must be obvious to every one who walks with his eyes open, and stands erect, how sadly neglected everything like agricultural pursuits (letting alone the more advanced steps of ornament, or Landscape Gardening) appear to have been in the suburbs of Cape Town, unless, indeed, the journey be extended to Rondebosch or Wynberg; and even there, what is there compared with its capabilities? In Van de Sandt’s Almanac, we find a long list of honourable names, as forming the Cape of Good Hope Agricultural Society, and another as an Expedition for exploring Central Africa, and another the Municipality of Green Point. Supposing once a year these honourable members were to lead by the hand a number of Malay boys and Africanders—after the manner of the Bluecoat Boys at Christchurch—and instead of travelling beyond the Salt River, were to confine their thoughts to the boundaries of each parish, and

mark how improvement and perfection were going on, and engraft well into the young minds, the then state of affairs, and the rude natures of their forefathers, and how much might be done by their individual exertions and tastes, as examples for those who supersede them, can it be imagined we should long possess so many broken down walls, weedy gardens, gates unhinged, dirty gutters, stagnant ditches, naked commons, and filthy receptacles, that are disgusting to the eye, and by no means ambrosial to the scent? As we lift up our eyes for relief from this *sheet*, and extend our view across the road over the common to the bay, what do we see but acres and acres of ground, in its present state fit for nothing and nobody? It is true the fish factory occupies a portion, and runs along the beach—but would have been none the worse if planted a few miles further, nor would the inhabitants of Somerset have shed many tears had the late gales been so fortunate as to remove it—but the remainder is left to worse than waste, as a depository for broken bottles and all kinds of garbage. There is scarcely a nibble for a donkey, and it forms an open cemetery for many a high-nettled racer and dead hack, and the leering curs lick their jaws and slink away from the carcasses, where the bones are bleaching in the sun, as the stranger passes. There also we perceive is the “narrow bed” of the Malay and the pauper. A few straggling stones and a piece of slate mark the open spot where—

“The breezy call of incense breathing morn  
No more shall rouse them from their lowly bed.”

And we perceive gigantic crows, with white collars, like sextons in a church-yard, are busy amongst the dead, either searching for a stray worm, or if perchance the departed may have left them a better legacy. Is there any hope of this waste land, these eyesores, ever being cultivated or changed? Shall spade husbandry cease to exist, shall the earth always thus lie fallow—shall we have no hedge-row and no green lane—are we never again to be visited with a field of beans in blossom—shall we never more pluck a peach from a garden wall. Will not the “black hearts” and “white hearts” come to perfection? Are the green “gooseeggs” gone for ever? Do we want elbow grease, or do we want guano, that we cannot find a bit of good turf, a yard of box, or a border of thrift? Do gravel walks turn to sand, and do little tufts and clumps of trees and shrubs wither and die by Sol’s warm rays? Are we too busy to attend to anything like *Landscape Gardening*? Shall a park-like scenery and an attempt at the picturesque never be considered? Is it beneath our no-



tice—is it unworthy of a thought? Shall we go on grubbing and scraping merely from hand to mouth, and not from thought to thought—not from worse to better, and from better to best? If so, good-bye Africa, for we shall be ashamed of you. But there are little birds whispering in the air, chirping that there is good in the wind. For something has been attempted and achieved that never existed before,—there is now a “*Montagu Bridge*,” that cannot be found in the old history of the Cape. Who knows what this bridge may lead to—who may pass over it, and what they may bring towards further embellishment? Who knows what young trees and plants are in store to be brought from the interior, over this new bridge along the hard road, and what flowery-minded men may accompany them, with the disposition and energy to spread a taste for *Landscape Gardening* around our suburbs and away into the *Flats*?

#### ON FORMING HERBARIA.

YOUR correspondent, a journeyman gardener's directions, for the formation of a collection of dried plants, are generally good, but cannot always be put in practice, and as I occasionally dry plants in a more simple way, it may be useful to modify his plan where necessary, I would, therefore, give the following hints:—

1. Although it is extremely desirable to take off the specimens in dry weather, yet this cannot be always done, particularly by the British botanist, who must collect his specimens when he falls in with them, whether they are wet or dry, and it is by no means indispensable that they be gathered dry—when gathered wet, it is advisable to lay them in a dry room, so as to remove as much moisture as possible, and afterwards to place them in the blossom-paper in the same manner as other specimens. The papers will at first require to be changed more frequently than otherwise, say every three or four hours, until the wet is absorbed; if this be attended to, the specimens may be equally well preserved.

2. The specimens when first put in the press need not be arranged exactly as it is intended afterwards to lie, it will be sufficient if this arrangement be made at the second or subsequent change, at any time of the second day, or about twenty-four hours after its being subjected to pressure: at this period the specimens should be laid out in the way it is intended it should afterwards remain, cutting out supernumerary leaves and branches, but leaving a part of their stalk to show that they once existed, which will preserve a more accurate notion of the figure of the plant when growing.

The arrangement of the specimens will be made with a pointed stick, the one hand laying down the covering blossom-paper, while the other, by means of the stick, gradually arranges the leaves and other parts of the specimens, until the whole is properly placed; this position will be kept in view at the after shiftings, the leaves can be set right, and the specimens arranged in the way thought most advantageous.

3. Instead of a fixed frame, as described in page 183, which presses very severely on the thick and woody parts of the specimen, leaving many parts of it without any pressure at all, I formerly used a small frame of wood, of the size of the paper, covered with linen, and upon this I poured as much lead shot as I considered necessary to give a sufficient degree of pressure: my after practice was still more simple, being merely to make use of a common handkerchief, and to place the shot in it. The quantity of shot was at first small, varying, however, with the number of specimens to be pressed, from three or four, to eight or ten pounds weight; but this I gradually increased to double that quantity, until the specimens were fit to take out of the press altogether, and I have no doubt in many cases a still greater quantity should be employed. It is observed that the pressure is in this case on every part of the plant, which cannot be effected by the frame and screws.

4. When the specimens are dried and put away, there should be no blossom-paper used, but strong cartridge-paper, or white writing paper may be employed, as the blossom-paper will be found to attract moisture, which will produce mould, and destroy the specimen.

5. In the choice of specimens, you ought neither to take a very large one, nor, as your correspondent advises, a very small one, but one of a medium size, as most likely to lead to ascertaining the identity of a plant of the same species, than if a different selection were made.

6. Instead of putting gum upon the specimen, and fastening it to the book or paper, lay the specimen flat, and fasten it with slips of writing paper, gummed at the extremities, put across two or more parts of it—the specimen can thus be taken out, if necessary, and every part of it examined; this will often lead to the discovery of the plant under examination. In the accompanying book, besides the name of the plant, and the class and order of Linnæus, let the natural order be also given; the place whence it was obtained ought also to be specified, and if a British plant, I consider this indispensable. Printed names of all the British plants for putting in Herbaria, are published by the Botanical Society of Edinburgh, and can be had at McLaughlan and Stewart's, Booksellers, Edin-

burgh, at a very low price—these will be found of great advantage to the collector.

There is an improved way of preserving the Fungi, which has done away nearly the whole trouble formerly necessary. I am sorry I cannot at present name the inventor of it, but it will be found by a reference to some of the later works on Botany. With regard to the smaller Fungi, it is done by pressure and drying alone, much in the way of herbaceous plants; as to the larger Fungi, it is by merely cutting out a thin slice, from the centre, showing thus the stalk, whether solid or hollow, and also leaving a few of the gills; if the slice can be made tolerably thin, and yet leave the peculiarities of the Fungi, it will be found to dry well, and can be kept with as little care as the specimens of an herbaceous plant.—JAMES HERIOT.

#### THE INSECT THAT ATTACKS THE GRAPE-VINE IN AMERICA.

OUR cultivated and our native grape-vines are attacked by various kinds of insects, most of which are peculiar to this country. Of these insects, some differ entirely from all those that inhabit the vine in Europe; but there are others which closely resemble some European vine-insects, and, without due examination, might be mistaken for them. The *Procris ampelophaga*, which has been found to be very injurious to the vineyards of Piedmont and Tuscany, is replaced here by another species of the genus, having the same destructive habits as its European counterpart. The young of the American *Procris* are little yellow caterpillars, with traverse rows of black velvety spots on their backs. The leaves of the common creeper, *Ampelopsis quinquefolia*, a plant belonging to the same natural family as the grape-vine, appear to be their natural food. Fourteen or fifteen years ago, swarms of these caterpillars were observed, by Professor Hentz, upon the vine at Chapel-Hill, in North Carolina, and constant care was required to check their ravages there, during several years in succession. How much the vine may have suffered from them, in other parts of the United States, has not yet been made known. Within a few years, these same insects have appeared upon the creeper covering the porch of the mansion-house of the late Madam Dix, in Boston, and also upon grape-vines growing behind the house, where the writer of this article has seen them in great numbers, and has had an opportunity of observing some of their habits and transformations. In the southern states several broods are produced in the course of one year, for Professor Hentz informs me that the cater-

pillars were found on the vines throughout the summer, and this accords with the history of the European vine *Procris*. In New England there are, at least, two annual broods. The transformations of the second are finished in the spring; and the first brood of the summer, the history of which has not yet been fully investigated, may be expected in June. This, therefore, appears to be a proper time to direct attention to this little destroyer, whose ravages are comparatively recent, or have been overlooked, hitherto, in this vicinity. In the middle of a warm sunny day, about the first of July, many small black moths were seen flying around and alighting upon the creeper, and they continued to appear, every fair day, for a week or more. There was some difference in their size and colour, the females being the largest, and glossed with blue; but, in both sexes, there was an orange-coloured collar around the neck. The wings expanded, in flying, about an inch. The body was slender, but thickened and tufted towards the end. These moths laid their eggs, in clusters, on the lower sides of the leaves, from twenty to fifty in each cluster. On the twelfth of August, caterpillars, of various sizes, which had been hatched from these eggs, were seen upon the leaves of the creeper. Some of them could not have been more than two or three days old, while others had probably been hatched ten days or more. The younger caterpillars were of a greenish yellow colour, and the black spots on their backs were very small. They kept together, in swarms, beneath the leaves, the caterpillars in each swarm arranging themselves in rows, side by side, with their heads all in the same direction. At first they eat small irregular portions of the lower surface of the leaf, leaving the cuticle above and the veins untouched; but as they grew larger, they eat up the whole leaf, excepting the stalk and the principal veins, and passing from leaf to leaf, they devoured each one, in turn, in the same way. The grape-vines suffered more from them than the creeper, long shoots of the former being entirely stripped of their leaves by the insects, before the source of the mischief was suspected and discovered. These caterpillars appeared to come to their full size within fourteen or fifteen days, then measuring, when at rest, about six lines, or six tenths of an inch, in length. Their colour, at this age, was a deep yellow. The segments or rings of the body were very distinct; each ring having a traverse row of eight, oval, black, velvet-like spots or tufts upon it. The feet were short, and sixteen in number. The head was very small, with three black spots upon it, and could be drawn almost entirely within the

first segment, which formed a kind of hood over it. A few slender hairs were scattered over the body, and were most conspicuous on the second and on the last ring. These insects were sluggish and slow in their motions, and, when touched, curled their bodies sideways, lost their footing, and fell to the ground; or, more rarely, they let themselves down a short distance, and hung suspended, by a silken thread. On the fourteenth of August, some of the largest, which were confined in a box, refused their food; and, on the next day, they made their cocoons, in the angles of the box, and on the leaves and stalks wherewith they were supplied. The youngest, however, did not spin their cocoons till the end of the month. This kind of cocoon is formed of very fine silk. It is of a yellowish white colour, oblong oval shape, slightly convex above, and nearly flat below, and is firmly fastened to the spot on which it rests. Though almost as thin as writing paper, it is opaque, and very close and tough in texture. Soon after the cocoon was finished, the caterpillar within it, changed to a shining brown chrysalis, very small, however, compared with the size of the caterpillar and the moth. The insects remained within their cocoons, without further change, throughout the winter. On the first of May, moths, similar to those already described, began to come out of the cocoons that were kept in the house, and others continued to make their escape till the twentieth of the month. In doing this the chrysalis first opened one end of the cocoon, and worked its way partly out of it; after which a rent appeared on the forepart of the chrysalis, through which the moth drew its body and wings. These insects were forced to come out before their time, by being kept in the house; for they have not yet left their places of concealment abroad, and probably will not finish their transformations, and appear in the winged form upon the vines, till the month of June. Although the history of the American *Procris* is not yet finished, enough of it has been ascertained to guide us in our proceedings, should this new-comer increase and multiply on our cultivated vines. Many of the moths, in their slow and short flights, may be caught upon the wing, by sweeping a bag-net of gauze over the vines. But, to the destruction of the insects in their caterpillar state, our efforts must chiefly be directed. A few minutes, daily given to an examination of the vines in June and in August, will enable us to detect them; and, by a single grasp of the hand, an entire brood may be crushed upon one leaf. Any fluid, offensive to insects, such as soap suds or a solution of oil-soap, thrown forcibly beneath the leaves with a syringe, will dislodge the caterpillars; and, even

if they be not killed by this means, they will find it difficult to mount again upon the vines.

T. W. H., Cambridge, Massachusetts.

#### MIGNONETTE IN POTS.

*RESEDA ODORATA*, or the Mignonette, is a native of Egypt: it is, under ordinary treatment, an annual plant, growing from six inches to a foot in height, and is hardy enough to stand this climate during the summer months; but it will not survive our ordinary winters, unless in some very sheltered situations. In order, therefore, to obtain a regular succession, recourse must be had to pot or box culture, which will form the subject of the following remarks.

The beginning of February is early enough to make the first sowing for a spring supply. The soil which should be used should consist of one half loam, one fourth part dung, and one fourth part leaf-mould, well mixed together, and used in as rough a state as possible: the worms (if any should be in the soil) ought to be carefully picked out, or they will cause great injury to the plants, by stopping the drainage and disturbing the roots. The pots known as "forty-eights" will be large enough for this sowing; and these should be prepared by placing a crock over the hole in the bottom, and laying on this about two inches of the roughest of the soil, after which they should be filled with soil, pressed evenly and firmly, leaving the surface level within half an inch of the rim. On this the seed should be sown regularly, and, if its quality can be depended on, two dozen seeds will be enough for each pot; they will come up stronger than if sown thicker. Sift a little soil over the seeds, and give this a gentle pressure with the back of the hand, leaving the surface smooth and even, but not "glazed;" then give a gentle watering with tepid water, which will warm the soil and assist germination. Plunge the pots in a frame with a gentle bottom heat, and keep the lights shut till the plants begin to appear; afterwards admit a little air every day, if the state of the atmosphere will allow; but at all times avoid the admission of currents of cold air, as I am convinced that mignonette suffers severely from too rash an exposure to cold winds. When the plants become a little injured to exposure, remove the lights every fine day, which will prevent them from being drawn, and better enable them subsequently to support themselves. As soon as the seed-leaves are fully developed, thin out the plants, leaving at this time ten or twelve in each pot; this number should be retained, as they are liable to damp off if over-watered, and especially if the weather should happen to be dull.

When they have made three or four leaves, thin them out to five plants, which number is sufficient for a forty-eight-sized pot; at the same time stir the surface of the soil, which often becomes caked by continual watering, and thereby prevents the access of air to the roots. When the sun begins to act powerfully upon them, a thin shading for a few hours during the heat of the day will be of great service, by obstructing its rays, which give to the foliage a yellow and unsightly appearance. When they have grown three or four inches, they will require to be tied up, to prevent them from falling over the sides of the pot. In doing this, place five small stakes at equal distances close by the edge of the pot; then pass a strip of matting with a turn round each of the stakes, and fasten it: it is necessary to leave the stakes two or three inches higher than the plants, as I have found them sometimes to require a second tie. If the roots at that time have found their way through the bottom of the pot, they must be broken off, or the plants will receive a severe check when finally removed. In re-plunging them, give them sufficient room to prevent their being drawn. They will require little more attention, besides giving plenty of air, watering, and shading, till the middle of May, when they will be in good condition for removing to the conservatory.

The next sowing will require to be made about the beginning of April. The same compost as previously recommended should be used. For this sowing, however, I would prefer 32-sized pots, and would allow seven plants to remain in each: by thus having a greater body of soil, it will be found to retain moisture for a greater length of time, and the plants will not be so liable to receive any check by an accidental omission of watering. In other respects, the treatment already detailed should be followed. By the middle of May, if the frames should be wanted for other purposes, the pots may be plunged in some shady place out of doors. They will come into bloom about the beginning of July. Other successional sowings should be made about the beginning of June and the beginning of August. These may be plunged in a sheltered spot out of doors; and, with attention to watering, thinning, and tying up, as previously directed, they will come into bloom respectively about the middle of August and the end of October. The latter of these sowings must be removed to a frame as soon as danger from frosts may be apprehended.

The next sowing, which is to provide plants for blooming through the winter months, must be made about the middle of September. A little more attention is necessary at this season of the year, in order to prevent them from

damping off, and also to secure as much of the sun's rays as possible. The soil I would recommend for this sowing consists of three parts of loam, one part of dung, and one part of leaf-mould. My reason for using more loam at this season is, because the compost then retains moisture longer than if a less proportion were employed; and thus the necessity of frequent applications of water is in great measure done away. In dull weather, *mignonette* is very impatient of water; and, when it is applied, it should be done in the morning, in order that the foliage may become dry before night. For this sowing I would use 48 sized pots giving them a good drainage.

In preparing the frame for their reception, it should be raised behind, so as to give it a good inclination towards the south, for the purpose of gaining the full benefit of the sun, and also of preventing drips, which are very injurious, as the plants seldom recover from checks occasioned by their becoming very wet. The bottom of the frame should be covered with brick rubbish, and over this there should be a stratum of rough coal ashes, and again, on the top six inches of finely sifted ashes. This must be arranged so that, when the pots are plunged, they may not be more than nine inches from the glass. When the seeds are vegetated, give as much air as possible; and by attention the plants will begin to flower about the beginning of December, and keep in good condition for three months.

The final sowing should be made about the beginning of October; using the same sort of soil and pots, preparing the frame in the same manner as directed for the proceeding, and taking great care in the watering and thinning. By the beginning of March the plants will commence flowering.

When frost sets in, cover the glass with mats and loose hay, taking them off on every favourable opportunity, as the young plants, when excluded too long a time from the light, will turn yellow, and damp off. I would also lay some long litter around the frame, to prevent the frost from penetrating through the sides.

It may be well to mention that, in thinning, the plants ought to be left as nearly of an equal size as possible in each pot, retaining the largest in some, and the smallest in others. This will give a longer succession of bloom; and, if at any time one sowing is likely to be over before the next is ready, pinch out the tops of a few of them when they are beginning to flower; this will cause them to break out again, and bloom three weeks or a month later than the others of the same sowing.

The cultivation of *mignonette* in boxes dif-

fers so little from that in pots, and boxes being seldom used except to stand in particular situations out of doors, it is unnecessary to say much on that head; but when they are used, the same sort of soil that has been recommended for summer use will suit them very well. I would, however, prefer to grow it in pots till it begins to flower, and afterwards to plant it into the boxes, where it will continue to branch out and flower for a long time. When it has done blooming, these may (if wanted) be filled again in the same manner, and thus a constant succession will be kept up. This paper, perhaps affords a good evidence, as anything of the utility of societies for the mutual instructions. It is the substance of a paper read there by Mr. Doig who has now removed too far north to read another for awhile, but, there is no good reason why his papers should be lost to us, when by sending them they may be read by others of the members.

#### THE HYDRAULIC RAM.

THIS useful machine the principles of which are but partially understood and valued, and but little used, is now exciting, some attention on account of the efforts which are making in its improvement, and from its extensive availability to all purposes where Hydraulic power is applicable or desirable, some account of the same may not be unacceptable or uninteresting.

To bring the Hydraulic Ram into operation, it is necessary that there should be a head or body of water, as a pond supplied from a spring, or a running stream from which a fall can be obtained. The Ram is an hydraulic machine composed of a body at the end of which is a valve called the pulse valve, which is closed by the momentum of the running water. On the top of the body is placed an air vessel, in the neck of which is another valve. The water forcing with an obstruction in the closing of the pulse valve, makes its way through the valve into the air vessel.—The air in the air vessel becoming compressed, the valve leading into it closes, and thus liberates the pulse valve. The same action takes place again with the pulse valve, as also with the valve that leads to the air vessel. This continuous action takes place, and at each time a portion of water is so forced into the air vessel. When the air in the vessel is compressed, so as to be enabled to overcome the resistance in the pipe leading to the cistern which it is intended to supply, the water flows over, and continues to do so as long as the Ram remains in action. Notwithstanding the simplicity of the construction, great

care must be taken in its manufacture to get the balance of the valves equal, as unless the pulse valve is upon an equilibrium with the other valve upon which it has to act leading to the air vessel, the weight of both columns being taken into consideration, no power can make them work. Most persons acquainted with Hydraulics are aware that a column of water weighs equal to the base, that is to say, that a pipe of one inch square, resting on a base of four inches square, will weigh sixteen times more than if it only rested on a base of one inch square. This is indeed the principle of the action of the Ram. I suppose it is required to raise water 100 feet high from a six foot fall, the Ram must be made in that proportion, so that the pulse valve must close so as to counteract the pressure of the rising column. If the valve leading to the air vessel is not along with this constructed with the utmost care, as above stated, the machine will not work. The younger Montgobfrier introduced into the neck of the air vessel, a small air valve, which opened and shut with the pulse valve. This valve was intended to supply the air vessel with fresh air in case of high pressure. I am still making experiments in the above machine, which I trust will enable me to throw a greater quantity of water with less waste, as the most which I have hitherto been enabled to do with a two inch supply to the ram, has been to throw five quarts of water per month to a height of 150 feet, consuming eleven parts out of twelve.

With regard to this useful and ingenious invention, the following description is given by Dr. Jamieson. "Ram in Hydraulics is a machine for raising water to any given height by means of the momentum of a stream of water flowing through a pipe. The passage of the stream being stopped by a valve, which is raised by the stream as soon as its motion becomes sufficiently rapid, the whole column of water concentrates on the valve, and acts as a single solid, so that it must resist any pressure. Now if the valve open into a pipe leading into an air vessel, a certain quantity of water will be forced into it, so as to condense the air more or less rapidly to the degree that may be required for raising a portion of the water contained in it, to any given height."—FULMAN ROE, *Hydraulic Engineer*, 70, Strand, London.

#### FRUIT LIST FOR SMALL GARDENS.

*A few good sorts of Pears.*—Louis Bon, November till March; Beure Rouge, September to November; Brown Beure, December till April; Jargonelle, ripens middle of Au-

gust, continues good till middle of September; Green Chissle, ripens in July, keeps till August; Bergamot (summer), ripens in September, and keeps a month; Pas Colmar, ripens in December, keeps till May; Maria Louise, ripens in October, keeps two months; Williams's Bon Chrétien, ripens September, keeps till October; Charmontell, ripens in January, keeps till June; Gansel's Bergamot, ripens at the end of September, and keeps a month; Von mons Leon Le Clere, same as the above; Lansac, ripens in December, and keeps nine months; Golden Beure, ripens in October, and keeps a month; Swan's Egg, ripens in December, keeps till May; Crassanne, ripens in December, keeps till the following August;

*A few good sorts of Apples.*—Franklin's Golden Pippin, dessert apple, ripens in November, and keeps till March following; Fearn's Pippin, dessert apple, ripe in October, and keeps till March following; Kerry Pippin, dessert and kitchen apple, ripe in October, and keeps till March following; Emperor Alexander, kitchen apple, August till October; Blenheim Orange, kitchen and dessert, September till February; Ribstone Pippin, dessert and kitchen apple, ripe in October, and keeps till March following; Nonpareil, dessert apple, ripens in January, keeps till April; Hawthornden, kitchen and dessert apple, ripens in August, keeps till January following; Royal Russet, kitchen apple, ripe in October, keeps till April following; Scarlet Nonpareil, dessert apple, ripens in September, keeps till the March following; Golden Harvey, dessert apple, ripens at Christmas, keeps till the May following; Norfolk Beaufin, kitchen apple, ripe at Christmas, and continues good till August; June eating, small dessert apple, ripe Jult, keeps till August; French Crab, kitchen apple, ready at Christmas, and keeps a whole year; Court of Wick, ripens in September, and keeps till January.

*A few good Plums.*—Green gage; Orleans; Coe's Gold Drop; Purple Morocco, early; Washington; Imperatrice; Magnum Bonum; Wine Sour; Goliah; Late Gage (Cant's).

*A few good sorts of Cherries.*—May Duke; Kentish; Biggarean; Late Duke; Black eagle; Florence; Morello; Circassian.

*A few good sorts of Gooseberries.*—Warrington Red; Wilmot's Early, red; Greengage Gooseberry, green; Whitesmith, green; Golden Drop, yellow; Yellow Champagne, yellow; Royal George, white; White Dutch, white.

*A few good sorts of Peaches.*—Early Avant ripens middle of August; Early Newington, ripens the end of August; Red Magdalen ripens end of August; Royal George, ripens beginning of September; Noblesse, ripens

middle of September; Old Newington, ripens end of September.

*A few good sorts of Nectarines.*—Elruge, ripens middle of August; Red Magdalen, ripens middle of August; Fanchild's Early, ripens middle of August; Temples, ripens middle of September; Late Newington, ripens middle of September; Red Roman, ripens middle of September.

*The best Seven out of door Grapes.*—Black Hamburgh; Miller's Burgundy; Black Frontignac; Grizley ditto; White Frontignac; White Muscadine; Esperione. If you increase to a dozen, the following are the next best:—Black Prince; Black Muscadine; Claret Grape; Malmsey-Muscadine and White Sweat-water.

*A few good Strawberries.*—Keen's Seedling; Elton Pine; Myatt's Pine; Myatt's Queen Victoria; Swainstone's Seedling; Fisher's Princess Alice Maude.

*A few good sorts of Currants.*—Black Currant; Large Red Currant; Large New White Dutch.

*Raspberries.*—Large Red Antwerp; Large White, twice bearing; Large Yellow Antwerp, but the Filby or Fostolf is the best.

#### FLOWER LISTS FOR LIMITED GARDENS.

*A few Show Carnations.*—Scarlet Bizaars.—Twitchet's Don John; Headley's Achilles; Strong's Duke of York; Colcut's Brutus; Rainforth's Game Boy; Smith's Duke of Wellington; Martin's Splendid; Lodge's True Briton; Roi d'Capuchins; Bucknell's Earl Fitzharding; Ely's Lord Pollington; Sharpe's Defiance; Elliott's Duke of Sutherland; Fletcher's Duke of Devonshire; Hale's Prince Albert; Appleby's Prince of Wales. *Crimson or Pink and Purple Bizaars.*—Ely's Lord Milton; Ely's Duke of Bedford; Mansley's Robert Burns; Sealy's Princess Royal; Puxly's Prince Albert; Wakefield's Paul Pry; Barnard's Duke of Roxburg; Ely's Hugo Meynell; Chamber's Kate; Holme's Count Pauline; Strong's Linnæus; Cartwright's Rainbow; Jaques's Georgiana; Veneble's Spitfire. *Purple Flakes.*—Ely's John Wright; Ely's Mango; Mansley's Beauty of Woodhouse; Mansley's Bonny Bess; Nix's Lady Chetwynd; Milwood's Premier; Martin's President; Wilmer's Solander; Christian's Excellent; Strong's Esther; Pollard's First-rate; Brabbin's Squire Maynel, Prince de Nassau; Turner's Princess Charlotte. *Scarlet Flakes.*—Simpson's Marquis of Granby; Twitchet's Queen of Scarlets; Chadwick's Brilliant; Bucknell's Ulysses; Wig's Earl of Leicester; Brown's Bishop of Gloucester; Ely's North Midland; Mitchell's Patriot; Jones's Brilliant; Wilmer's Hero of Middlesex; Greasley's Mary-Anne; Wilson's

William IV.; Addenbroke's Lydia; Holdham's Defiance. *Rose Flakes*.—Brook's Flora's Garland; Ely's Lady Ely; Ely's Lovely Anne; Greasley's Village Maid; Hyan's Queen Victoria; Askwit's Miss Walker; Tomlin's Bresies; Iron's Defiance; Wood's Rosabelle; Wilson's Harriett; Barranger's Apollo; Fletcher's Duchess of Devonshire; Lowe's Marchioness of Westminster; Elliot's Duchess of Sutherland; Hufilton's Rosea.

*A few Show Piccotees*.—*Red Edge*. Barraud's Cornelius; Sharpe's Duke of Wellington; ditto Gem; ditto Red Rover; Wildman's Isabelle; Headley's Sarah; Brinklow's Rising Sun; Sharpe's Countess de Gray; Giddin's Princess Royal; Kirland's Duke of Wellington; Sharpe's Hector; Brinklow's Masterpiece; Jessop's Sir W. Middleton; Burrow's Mrs. Bevan.—*Purple Edge*: Headley's Nannette; Brinklow's Pre-Perfection; ditto Lady Chesterfield; Dickson's Trip to Cambridge; Giddin's Vespasian; Ely's Field Marshal; ditto Mrs. Fenton; ditto Favorite; Kirkland's Princess Augusta of Cambridge; John's Prince Albert; Barraud's Coriolanus; Mansley's Nulli Secundus; Sharp's Invincible; ditto Agitator; Wilmer's Prince Royal.—*Rose and Scarlet Edge*: Barnard's Mrs. Barnard; Barraud's Bride; Green's Queen Victoria; Kirkland's Mr. Annesley; Twitchet's Fair Rosamond; Wilson's Miss Fanny Irby; Wain's Queen Victoria; Dickson's Bride; Garratt's Lady Dacre; Wilmer's Princess Royal.

*A few Show Auriculas*.—*Green Edged*: Dickson's Matilda; Page's Champion; Lee's Colonel Taylor; Booth's Freedom; Pollett's Highland Boy; Stretche's Emperor Alexander; Smith's Waterloo; Hudson's Apollo; Dickson's Earl of Errol; Dickson's Duke of Wellington; ditto Prince Albert; Lightbody's Lord Lyndoch.—*Grey Edged*: Fletcher's Ne Plus Ultra; Waterhouse's Conqueror of Europe; Dickson's Unique; Oliver's Lovely Anne; Kenyon's Ringleader; Syke's Complete; Hedge's Britannia; Grime's Privateer; Maclean's Unique; Fletcher's Mary Anne; Dickson's Duke of Sussex.—*White Edged*: Taylor's Glory; ditto incomparable; Popplewell's Conqueror; Thorpe's Magpye.—*Self Coloured*: Redman's Metropolitan; Netherwood's Othello; Dickson's Apollo; Bury's Lord Primate. For those who keep a stage of flowers, and grow a collection, the following may be added with advantage: Cockup's Eclipse; Metcalfe's Lancashire Hero; Gorton's Champion; Warris's Blucher; Franklin's Bellona; Gable's Duke of Wellington; Page's Duchess of Oldenburg; Pearson's Bodajos; Moore's Violet; Page's Lord Hill; Smith's Britannia; Yate's Lord Collingwood; Foden's Fair Rosamond; Pillar of Beauty.

*A few good Dahlias*.—Antagonist, white (Bragg); Essex Triumph, dark (Turville); Admiral Stopford, dark (Trenfield); Bridesmaid, tipped or shaded white (Brown); Burnham Hero, maroon (Coker); Bedford Surprise, puce and crimson (Shepherd); Dowager Lady Cooper, rose (Jackson); Prince of Wales, yellow (Dodd); Princess Royal, straw ground, purple edge (Hudson); Queen, rose (Widnall); Sir F. Johnstone, dark puce (Hillier); Mrs. Shelley, rose; Vivid, scarlet (Bragg); Indispensable, dark rose (Girling); Argo, yellow (Widnall); Beauty of the Plain, white purple edge (Spary); Duchess of Richmond, shaded pink; Defiance, yellow (Cox); Exquisite, white, mottled with purple (Holme); Grand Boudoin, shaded dark (Low); Conservative, light purple (Low); Eclipse, scarlet (Widnall); Eclipse, scarlet (Catleugh); Northern Beauty, white crimson edge; Metella, purple (Begbie); President of the West, crimson (Whale); Phenomenon, white edged with purple; Climax, purple (Jeffries); Hope, dark rose (Neville); Unique, yellow, edged brown (Ansell); Maria, rose (Wheeler); Conqueror of the World, yellow, tipped purple (Stein); Springfield Rival, crimson (Lyne); Egyptian King, shaded light rose (Willmer); Victory of Sussex, dark puce (Stanford); Andrew Hofer, dark crimson (Holmes); Competitor, rose (Hodges).

*Dahlias. Some of last Year's added*.—Standard of Perfection, deep crimson (Keynes); Lady Antrobus, white, edged with purple (Spary); Sir J. Stuart Richardson, rose shaded (Sharpe); Lady St. Maur, white tipped (Brown); Consolation, shade purple (Widnall); Queen of Roses, fine rose; Rembrandt, purple (Burn); Aurantia, orange shaded (Spary); Orange Superb, ditto (Keynes); Nonpareil, deep scarlet (Girling); Bermondsey Bee (Girling); Bathonea, crimson (Drummond); Trafalgar, rose (King); Emma Nokes, blush (Keynes); Essex Champion, orange (Sorrell); Twickenham Rival, yellow (Gaines).

*New Dahlias*.—The eight new flowers placed by the judges at the Royal Bazaar, Baker Street, London, 1844:—Bourne's Marchioness of Ormond, Drummond's Beeswing, Atwell's Cleopatra, Cook's Albion, Brown's Arethusa, Heele's Empress of the Whites, Wick's Essex Primrose, and Langley's Duke of York. Last year's prize flowers not let out till next spring, *Essex Bride* and *Leander*.—OTHER FLOWERS THAT WE HAVE SEEN: Smith's Lady Sale, Francis La Polka, Sharpe's Caledonian, Keyne's Antler, Dodd's Marc Antony, Gebherd's Gloria Mundi, Wick's Beauty of Chelmsford, Essex Scarlet.—SOME THAT WE HAVE ONLY HEARD OF: Ithuriel, Mary Anne, Harrison's Duke of York, Essex Scarlet, Islington Rival,

Highgate Surprise, Fairy Queen, Mazeppa, Keyne's Duke of York, Alice Hawthorn.

*A few new fancy Dahlias coming out.*—Mons. Jean Wallner, black and white (Girling); Mad. D——, deep crimson and white (Girling); Mad. Rignon, bright scarlet and white (Girling); Mad. Cuvier, primrose and red (Girling); Speedwell, dark and pure white (Girling); Harlequin, scarlet and white (Dodds); Columbine (Dodds).—*A few of the best fancy Flowers already out:* La Vogue, orange and white; Archduke Frederick, lilac and white; Belle du Donk, lemon and pink; Madam Chauviere, pink and white; Madam Miellez, (Keynes,) light purple and white; Madam Miellez, (Girling's) pink and white; La Lionne, scarlet and white; Madam de Schwanenfield, vermillion and white; Miss Watson, deep lilac and white; Oakley's Surprise, crimson, purple, and white; Brutus, deep sulphur and white.

*A few Camellias, with Flowers, in style of "Imbricata."*—Adelaide, a very deep red; Agnesii, a bright rose; Alba Fenestrata, a very pure white; Amabilis, a rosy carmine, sometimes spotted with white; Beallii, (Leana Superba,) vivid red; Bysanthina, rose, spotted, or striped with white; Duchess D'Orleans, white, tinted or spotted, with rose or carmine; Hendersonii, (Lombardii, Jacksonii, Landrethii,) delicate rose, blanching towards the centre; Imbricata, rosy carmine; Minuta, rich cherry rose; Palmer's Perfection, a beautiful carmine; Prattii, a fine large bright rose; Pulcherimma, a rich dark red; Queen of England, a delicate rose, striped with white; Sarniensis, a beautiful carmine; Sherwoodii, a bright cherry colour; Sulcata, (Belle Irene,) white, with a pale yellow stripe in the centre each petal; Penesa, a brilliant red; Wallichii, of rich dark carmine.—*A few others with Flowers in the style of the "Old Double White."* Apollo, a transparent rose; Aurora, a salmon rose, marbled with white; Brochii, cherry rose, generally striped with white; Calypso, very large pure white; Candidissima, pure white; Carsweliana, salmon red, striped with white; Cœlestina, extremely delicate rose; Cocquetta, salmon rose, diffused with white spots; Cooperii, reddish salmon; Elegans, very large, sometimes marbled with white; Estherii, white, with rose flakes; Fordii, salmon rose; Grunellii, very pure white; Harrisonii, very pure white; Helena, deep poppy, red; Henri Favre, bright cherry rose; Hookerii, pomegranate colour, spotted with white; Imbricata Alba, creamy white, striped with rose; Marchioness of Exeter, delicate rose; Marguerite Gouillon, blush rose, spotted and striped with carmine; Mutabilis Traversii, brouzy salmon with white stripes; Negri, car-

nation colour, spotted with red; Ochroleuca, creamy white with buff centre; Palatinus Hungaricus, red, diffused with rose, white spots; Queen Victoria, reddish carmine, striped with white; Rudolphii, white, with broad blood coloured stripes; Susannah, blush rose, shaded with salmon, and striped with carmine; Woodsii, fine large rose; Wardii, brilliant red.—*Anemone Flowered:* Dobreii, brilliant poppy red; King, pure white, striped with rose; Duchess de Nemours, transparent white, tinted with carnation, and striped with rose; Lady Harriet, a very large deep salmon rose; Tourresianii, brilliant cherry colour; Monarch, blood colour, striped with white, beautiful thick smooth petals, but not quite double; Collettii, blood colour, marbled with white, ditto, ditto.

#### NOTES ON THE CULTURE OF A FEW SELECT FLOWERS.

THE Hyacinth comes over from Holland in large quantities and full grown blooming bulbs, they are never imported in any other state, people are apt to fancy they grow finer in Holland than in this country, but it is not so.—The Hyacinth grows larger each season up to a certain point, when it blooms in the greatest perfection and splits into offsets. But the Dutch make the bulbous roots an article of exportation; therefore, on taking up large quantities, all those which have arrived at their largest growth previous to blooming are laid aside for export or sale, and the remainder removed to have another season's growth, but during the growth of the Hyacinth from the small offsets to the large bulb, they are not allowed to bloom, but as soon as they throw up their spike all the buds but the top one or two, are picked off; offsets in a very small state will throw up a little spike of three or four pips, and if allowed to perfect them the bulb swells but little, disbudding is the most important part of the business, and the sooner it can be done the better. As to the stuff best for their culture, nothing beats a light sandy loam. As the bulbs are always bought in perfection, the only thing we have to care about in England for blooming them is great attention to their constant moisture, but whether that be given them in the sand or loam, or even water itself, the blooms come fine. There are those who prefer very rich soil, and very large growth, the consequence of which growth is a much longer stem, the flowers further apart, and the plant as a whole much less compact. The principal thing we have to care about here, is to make the most of the roots after blooming, the best stuff for growing the offsets up into blooming roots, is one-



third loam, one-third rotten cow dung, and one-third in road sand. All that bloom in glasses should be laid in by the heels, as it is called, that is a trench is made with one side very sloping, and deep enough to take the long roots straight out; the bulbs are then laid just under the surface, and the long roots are carefully stretched down the bank, and parted a little that they may not be bruised: when a row is thus made, the earth nicely crumbled, must be thrown on to the roots from the further side the trench, which in fact keeps forming the trench further back, and stuff thrown on continues the form of a bank about six or eight inches further. You may lay another row, and so on until all are out, the decaying flowers must be picked off to prevent seeding; when the leaves have all decayed down, the roots may be taken up and kept separate, so as not to have two sorts mixed together, and each sort may be placed in a paper bag with the name on. In November prepare a bed of the stuff we have mentioned a good eighteen inches deep; draw drills deep enough to place the bulbs two inches under the surface, and here let them all be placed, the small ones three inches apart, the larger ones six, cover up, and it is as well to throw some litter over, during the hard winter, when they rise above ground; light litter must be always on them during frost as the spikes rise, pick off all the pips of bloom but the top ones, and let them be kept clear from weed, the earth be occasionally loosened on the surface, and they may grow on till the leaves have died down, when they may be taken up as before, each year there will be some large enough to take out for blooming roots.

THE TULIP is also an article of considerable commerce at Holland, but the English have so far excelled them in the fancy varieties that the trade is now chiefly confined to what are called early Tulips, of which there is a great annual consumption to supply the large towns of England with spring flowers that rarely survive their first season. This flower is so familiar, and its cultivation so simple that one hardly need touch upon it, except as to one or two features worth noticing. It is singular that those who have cultivated it for years in this country, and who have spent thousands, have never yet been able to calculate upon a Tulip coming two years alike, not that we deny them doing so occasionally, and even some kinds being more constant than another, but such connection as this among the finest growers in the world is by no means uncommon, indeed it is constantly the tone—"My *this* has come very heavy this year, my *that* has come nothing but feather—and last year it was a flame,—

my *the other*, has hardly any colour at all," this might be taken as a bit of an hour's talk, all carried on in the same tone of complaint or satisfaction, as each of a hundred flowers are mentioned one after the other. This uncertainty in the bloom of a Tulip is not more extraordinary than one strange feature in its progress from seed. In a general way the first bloom of a seedling Tulip is without any stripes or marking at all, and it has a white or yellow bottom with the rest of the flower, red or brown, or purplish brown or crimson. In this state they are called breeders. They will bloom for years in this manner, and increase in numbers amazingly; at length, without any one knowing why, or wherefore, or how it is effected, the colour which has been for years spread over the greater part of the petal breaks away, clears out of the great portion of surface, and concentrates into veins or blotches, or feathering round the edges of the petals and this is called breaking. There is no other flower that we know of which undergoes a change like this. The colours of a broken Tulip, as it is called, are always more dense than the colour of the breeder, which fact seems to indicate that the same amount of colour that had to cover the whole is then occupied in covering the veins and feathers only, and is therefore more brilliant. This singularity accounts for the frequent changes in the marking, for certain it is that they occasionally exhibit every variety between the best and finest marking and the original patch, and some will now and then go actually back to the breeding state, where it may be grown for years before it breaks again. The wisest of growers seems as far as ever from knowing anything about what produces the breaking of the colour, and what causes them to run heavy or go back again; but experience has convinced us that a popular notion which has prevailed is erroneous. It has been thought that the loam can hardly be too poor and light, and that poor stuff preserves the delicacy of the colour better than rich. It does nothing of the kind; they will run back to the breeder and be heavy in colour occasionally without there being any possible means of accounting for it. The very best soil for Tulips is a rich loam, formed of turfs from a meadow, and well rolled, and this should be two feet deep. But as turfs are often full of wire worms and grubs, they should be spread out and turned over once or twice to let the birds peck them out, and a great many are got rid of instead of stacking them all in; this takes a year to rot properly, and it should then be turned over and examined for the grub and wire worm several times, until you are satisfied there are no more. Now

this being quite as much vegetable manure as it is loam, and nothing can be better in all respects for the growth of the Tulip. They thrive far better without any other manure. In such a quantity as a two foot depth of soil the excrementitious matter given out by Tulips is almost lost by the constant turning over it has from the time the roots are taken up to the time they are planted again, otherwise this soil, which will last some years, would hardly do a second time so well as the first; but it is always better to change half of it about the third year. The Tulip is known to be a very hardy bulb, scarcely any severity of the weather kills, but the slightest frost that can reach them damages the bloom; we recommend even from the time they are planted a quantity of peas haulm lightly placed over the top of the bed, and when they are coming through, a cloth that is waterproof may be thrown over the haulm.

**RANUNCULUSES.**—The metropolitan growers of this favourite flower have not been so numerous of late years as formerly. Building has destroyed hundreds of small gardens, and checked as many amateur gardeners, and of a hundred that are disturbed scarcely ten have the power or the opportunity of going further a field. The societies were once far more numerous than at present, and no flower more requires that assistance which the trade alone can give by encouraging amateur shows. This, like the Tulip, luxuriates in loam, such as rolled turfs produce, and requires no other aid; but it has been the fashion to give them half loam of the ordinary kind, and half rolled cow dung. The principal objection to dung of any kind is the insects that it breeds, notwithstanding, there is no harm in giving a foot beneath the surface an inch or two of dung rotted into mould. We have known them grow for years without dung in the mould, or loam of rotted turf, well knocked about and frozen in winter, for the decayed vegetation is as good as any manure in the world. The principal point to be attended to in the culture of these things is to keep the earth well solid about them, and this must frequently be looked to, as the swelling tubers disturb it, and it should be well pressed down to them, especially if, as is often the case, they raise lumps of earth up. Another point, however, worth noticing rather carefully is the cutting off of the lateral blooms after the principal ones have done their duty. It is by no means uncommon for the *Ranunculus* to bloom itself into so weak a state as to prevent the growth of the tubers. This is the cause of tubers coming up weak after a heavy bloom.

**THE ANEMONE.**—This requires treatment so much like the *ranunculus* as hardly to require

a second notice, except that a few remarks on the state of the flower may be acceptable. The double *Anemone* now is composed of broad flat petals, forming a dish of circular shape, and the centre embellished with a cone of florets of a different colour to the broad petals. But these have never been well received as florists' flowers, and florists should go to work another way. There are plenty of varieties now, with two and even three rows of the broad petals, to increase these to the full number required to make them fill right up, and so produce a flower like a *ranunculus* of a large size. We have had them with three rows of petals, and cannot but fancy they can be got completely double, then it will be a flower worthy of a florists' notice. The general culture is the same as that of the *ranunculus*, except that it will flourish in stiffer land than the *ranunculus* will grow in, and it may be planted a trifle deeper, but in all other respects the same. The only step necessary in pursuing the object we have recommended with regard to doubling the flower, is to select a few with double rows of petals, and sow seed from them, and keep the best every year, and the instant any worse appear in bloom throw them away that they may not impregnate the rest. This is how we proceeded to get the little advance we made, and have no doubt it will ultimately succeed.

**THE CROCUS.**—This very beautiful early flower is not used half enough in the ornamental garden. The enormous extent of the varieties, and the great diversity of colours, render them the very best of all clump plants, beautifully dwarf in their habits, so that they are capable of being placed in the smallest and most intricate mathematical garden. Then again, the colours enable us to form an entire Dutch garden in flower all the months that flowers are most scarce. Blue, yellow, white, and striped, in almost every conceivable variety, may be placed in the different beds to cover the entire surface, without prejudice to anything that is to follow. They have to be planted about two inches deep, and six inches apart—this leaves room for succeeding plants to be placed between them. In borders they should be planted in patches, they look mean and common when used as edgings only, though that is the principal manner in which they were generally used for many years. They require no particular soil, for they will grow anywhere, but like most flowers they grow best in loam.

**THE IRIS.**—The principal kinds of *Iris* cultivated among florists are, the Persian *Iris*, the Spanish *Iris*, and the English *Iris*, all with bulbous roots; but that which has been most of all in estimation is the English *Iris*, which has now been produced of so many colours and

varieties as to be adopted in collections with names. Mr. Salter, who has the last few years been at Versailles, has been especially successful in raising new varieties, and some of them have been figured in our London works, the *Horticultural Journal* for instance, among others. The flowers grow on rather elegant stems, about eighteen inches from the ground, and as the three broad petals hang over and droop elegantly, with their best or inner surface well exposed, they have a rich and showy effect. If the wet is kept from them, they last a considerable time in bloom. The soil in which they seem to luxuriate most is a rich loam, with sand and peat enough to lighten it, that the water may pass through well, and they must be upon a site that is well drained. They are pretty hardy, and look as rich in a collection as many flowers, although there are no striking contrasts in the blooms, as blues and purples are the chief colours. There are approaches to white and brown and yellow, and variously veined and shaded. The roots, or rather bulbs, may be purchased at the ordinary seed-shops.

**THE CROWN IMPERIAL, OR FRITILLARY.**—The singularity of these flowers is, that they hang in circles all round the plant, near the top, and the green top of the shoot forms a sort of crown, whence, probably, its common name. The culture of this plant is very like the lily, and the colours merely varying from very pale yellow to very deep orange; but the whole tribe is pretty, and bloom early; forming very handsome objects in the open ground. The form of the plant is handsome, and the flower is noble; but although they most frequently come with only one row of bells, as it were, we have seen three rows one above another, and then the plant is a noble object, and worthy of a place anywhere in the best dressed grounds. There are other kinds of Fritillary, with different characters.

**THE DAHLIA.**—Very few people require to be taught much about this flower; not one in twenty, however, may be aware of the mischief that arises from some of the practices now very common among exhibitors. Those who travel far with blooms, may take it for granted, that if a bloom has been covered, it will not keep so well as one which has flowered in the open air, for which reason those who go far should never depend much on any single bloom that has been covered. Another fact worth noticing is, that the colours of those that have bloomed in the open air far excels those opened under cover; and that a stand of one as compared with a stand of the other, is almost as great, as fresh and stale vegetables. Dahlias should never be cut until the bloom buds show, and then but few branches should be

cut out, and they only such as are growing across others. The buds should be thinned, for it is by these that the strength of the plant gets exhausted; by removing all that are too near one to be bloomed, and all those that show imperfections enough to prevent them being useful, much strength will be gained by the future flowers; so also will pulling off the blooms themselves the moment they are past perfection, instead of letting them seed, assist.

**THE AURICULA.**—This is perhaps one of the most important, though, round the metropolis, most neglected florists' flower, chiefly because it requires air and great attention, though, with care, its culture and management is all simple enough. So much has been written upon the subject in this work already, that there is but little worth notice that can be well added. The chief thing that we have observed among all the cultivators is, that those who succeed in growing it most rapidly, do not equal their growth by their bloom, while they who bloom them best make slow growth and consequently less foliage. The medium should generally be observed, and in a general way, the more simple the culture the better the bloom and sounder the plants. Those who have encouraged the excited growth are far more liable to accident, and some have lost whole collections, for disease is far more likely to attack plants in an excited state than others which are grown in simple compost, and not put out of their natural way. Another set of cultivators, who used to grow the flowers to an immense size, and carry all before them, in the absence of that taste which now rules paramount in all good societies, sacrifice the beauty of the flower, and produce a coarseness which destroys the properties most valued. This all suggests a medium in the treatment, and this is best secured by sound, harmless soil, and pure manure. The mould, of rotted turfs from a loamy meadow, forms the best base in the world: leaf mould is therein abundance. The most valuable dressing is neat's dung, when well decomposed to a sort of mould: if there happened to be an excess of this, it is harmless, if care is taken that there is sand enough to make it porous, to let the water pass freely through it. If there be two-thirds of the rotted turf, the other third may be all neat's dung, if the rotted turf be already sandy, and if not, it may be made up of sand and neat's dung. This and pure air will be found to do all that is necessary for the Auricula.

**THE PRIMROSE.**—This family delights in shade, but too many give it shade by placing it where it is naturally shady, without once recollecting that it is also damp. Now, shady borders ought to be regularly made up with

very dry bottom, and a good drainage. The soil for the Primrose should be a good strong loam, with sand and cow dung, at least twelve inches deep, and if it be next to a hedge or fence infested with slugs or snails, a good ridge of lime at the back of the plantation will be advisable. The different varieties of this beautiful flower make a great show early in the season. The double white, double straw-colour, double lilac, and double crimson, are the most striking, and, when well grown, will continue in bloom a considerable time during the early months of the year. We have seen very neat collections healthy when planted out, and gradually get worse from that moment. The damp, adhesive, soft, unwholesome soil, would have killed a thousand, and there would be no exception to the mortality if such a term be allowable, which awaited whatever was placed there. The cause was the want of drainage, for even the soil would be improved by drainage. It is, however, much better to make a border at once; a very small plant of the Primrose will grow to a large size, and bloom abundantly the first season.

**THE POLYANTHUS.**—If we were to repeat every word we have written above, for the guidance of those who grow the Polyanthus, we could hardly do better. The difference would be, that the Polyanthus would bear a top-dressing of cow-dung just as the bloom began to show. This assists in the size and colour of the blooms. The Polyanthus is a show flower, and bears the flowers in a truss. As this truss rises, the smallest of the pips or buds should be cut out to give strength to the remainder; whereas, the Primrose throws up its flowers singly on long foot-stalks, and cannot be assisted by removing any of them, though the plant itself, like all other plants, would be strengthened by removing all the buds as fast as they appear.

**THE CARNATION AND PICCOTEE.**—We have little to say upon the general management of this flower: perhaps the only hint we shall offer is with regard to the layering. The common process is to cut all the tops of the leaves off square, and we are quite certain that the plants are far better without suffering the loss of the tops of the leaves. This practice originated in their taking less room in the pots, and being more hardy to operate upon, so that many who layer themselves set boys to cut off the leaves up to the part that is to be laid under the soil, and then cut the tops of the leaves square down almost to the heart of the plant. We have proved them, side by side, done both ways, and protest against shortening any leaves above the work itself. We have seen some of the most handsome plants sent off this season from the autumn layers, and they prove to

have been done upon the plan we have recommended, and we especially beg amateurs to try both ways at the same time, in the same pot if they will, they will find which is best before they have been layered a month.



**SOLDANELLA MINIMA.**

THIS is a very interesting rock plant, with blue flowers, formed like a bell or sugar-loaf, with notches round the edges, the blooms rising upon long flower stems, one or two flowers on each—all the sorts are blue or purple, and most of them from Switzerland. Soldanella Minima is a handsome dwarf plant, with bright green tufts of leaves. The plant is not quite hardy, and therefore requires protection of litter, or something that will keep off frost. If planted on rock-work it is very ornamental, and may be considered one of the prettiest of the Alpine plants. It will grow in any soil in which brick-rubbish forms a part.

#### **GLENNY'S GARDEN PRACTICE.**

THE present month and January are the most uncertain, perhaps of the whole year as to garden operations. It may be so wet as to defy any approach to business, for nothing can be more injurious to a garden than to trample it in soft swampy weather; it squeezes the air out of the ground, forms a solid lump wherever the foot falls, and if there be any extent of trampling scarcely anything can thrive until it has undergone the drying and pulverising necessary to open it properly. For this reason all operations that causes us to leave the paths are objectionable. For this reason the pruning of wall-fruit trees should, if not already done, be still delayed, rather than trample on the borders. Nor does the ground work call for anything. It is useless, as well as injurious, to hoe weeds up, for they grow into the ground

again instead of drying up. If it be frosty, fifty things may be done; dung and dressing of all sorts may be carried on the ground and spread. Every pruning and nailing can, unless the weather be very severe indeed, be done as well as at any time; and where standard trees require limbs or branches sawed off, it is not bad exercise; but any that from their situation require you to mount the tree will be better delayed; the branches are too slippery to be trusted, though it is easy to make a pair of steps or a ladder safe enough to stand upon for any that can be thus brought within reach. Hot beds are often made this month for various purposes—forcing asparagus, getting forward cucumbers, blooming of bulbs, and dwarf flowering plants (for which purpose deeper boxes than are usually employed for cucumbers must be used). Many begin forcing rhubarb, sea-kale, &c., this month, and many are the ways of doing it. It matters little how they are covered, but whether with heaps of earth, sand, leaves, boxes, or pots, the surrounding medium must rise the temperature, and for this nothing is more effective than stable dung. I have seen for rhubarb, boxes or troughs, open at both ends, one foot square, two feet long; these have been placed over the crowns of the plants, the top covered with a flat board just large enough, and surrounded with stable dung. The rhubarb plants throw out their first leaves strong, and the stalks are soon as long as the boxes. They are taken as they are required. They are always pale, and do not require skinning. They are never so highly flavoured as when grown in the open air or with light. The sea-kale may be covered with a common flower pot, or be earthed up; all that has to be taken care of is, that the hot dung does not touch it. Dampness is in general a greater enemy to plants than frost is, and too much precaution cannot be taken against it. In greenhouses, cold frames, and pits, it will cause mildew and mischief in a short time; therefore all situations where these constructions are placed should be well drained, plenty of air given, and if the lights be puttied at the joints, or the cloth substitutes be used, the lights should be always tilted to let out the damp which will otherwise accumulate and rot the cloth, as well as mildew the plants. In greenhouses the lighting of a fire occasionally, and giving air at the top while the house is warm, will effectually expel the damp. Where plants are protected with any description of covering air must be given every opportunity, for on that depends their health.

#### SEDUM SPUREUM.

THE entire genus to which this is attached



will thrive on very poor dry or hot gravelly soil, provided moisture be occasionally supplied; but brick rubbish, which absorbs wet and retains it, is particularly applicable and favourable for their growth. The various kinds comprise white, blue, red, orange, and yellow flowers; but the present species is a pretty evergreen perennial, with white flowers, blooming in August, and originally from caucasus. It is worthy of a place in all ornamental rock work; it is like the majority of the genus, quite hardy, and grows freely almost anywhere.

#### VARIETIES.

THE GARDEN OF THE LUXEMBOURG and the Palace was commenced in 1616 by the celebrated Queen Marie de Medicis; but its present grandeur is indebted to Louis XIV, who had the gardens laid out in his usual magnificent style. The Royal Nursery, the first and most extensive in the world, is the work of Baron Chaptal, who turned the gardens of the Convent of La Chartreuse into an experimental nursery, when Minister of the Interior under the late Emperor Napoleon. Here there are no less than 570 varieties of vines, the growth of the different departments of the Herault, Landes, Yonne, Basse Pyrenees, Po, Hautes Pyrenees, and Pyrenees Orientales; Dordogne, Vaucluse, Lot et Garonne, Lot, Jura, Vienne, Cote d'Or, Drome, Seine et Marne, and Paris; Bouches du Rhone, Marseilles, Avignon, &c.; Maine et Loire, Vosges, Haute Saone, Mayenne, Haute Marne, Ardeche, Bas Rhin, Haut Rhin, Aube, Haute Garonne, Bordeaux, Charente, Gironde, Alpes, Doubs, Cantal, Aisne, Deux Sevres, Bernardy, Loir et Cher, Loire, Moselle, Roussillon, Perpignan, Montpellier, Languedoc, Burgundy, Champagne, &c., which are divided as follows:—Black oval-shaped grapes, 114 varieties; black round ditto, 190; white oval ditto, 76; white round ditto, 133; violet coloured oval shape 19 (sweet wines); round grapes,

ditto, 38. There are about 80 varieties of figs, and a numerous collection of mulberry trees, peach, nectarine, apricot, orange trees, and other rare fruits, of which the public can obtain shoots or graftings at a very trifling expense, to transplant. This facility afforded by the government has had the most beneficial effects, in producing an emulation for horticultural pursuits among the rural population throughout France. In the Pepinierie, or Royal Nursery of Plants, formerly in the Faugourg St. Honoré, during the reign of Louis XIV., (but which was destroyed during the Revolution of 1793,) so great was his mania for horticulture, that no less than eighteen millions of tulips and other bulbous flowers were sent from thence to the gardens of Marly in four years; and that, for furnishing the parterres in the garden of the Trianon, at Versailles, with flower-pots in season, every fourteen days in the summer, no less than 92,000 pots were required from hence by Monsieur Le Notre; so that the director had constantly several hundred gardeners at work, so as not to incur the displeasure of his floricultural royal master.

**SPORTS OF NATURE.**—Sir, I have at present a good specimen of *Anterhinum Caryophylloides* in flower; there is one shoot of this plant just the same as *A. bicolor*, and all the rest distinctly *Caryophylloides*, and it also flowered last season distinctly *Caryophylloides*. I observed last season an instance somewhat similar, in a beautiful specimen of scarlet Thorn; the whole tree was covered with scarlet blossom, except one branch which was pure white. I examined this branch and found it entirely a sport of nature.—Yours, &c., J. LOTHIAN.

**ASPHALTE BOTTOMS TO FRAMES.**—This material laid on the ground properly on a very gentle slope, is the best thing in the world for the bottoms of frames in which things are to be preserved from the wet and cold of autumn and winter. In paving or gravel, the wet soaks between the stones, and gives off a damp when you want the frame dry: but asphalté admits none and gives off none; it runs off in consequence of the slope, and mildew in such a place is hardly possible. Carnations, Verbenas, Auriculas, and many other things requiring dry wintering, succeed admirably under such circumstances.—W. D.

**GRAFTING.**—The fine varieties of ornamental Thorns may be grafted on a common hedge row. The most supreb of the hardy hybrid *Rhododendrons* may be grafted on the noble plants of *Ponticum* and *Maximum*. The *Arbutus Andrachne* and *Procera* may be grafted on the common Scarlet; the varieties of Chesnut on the common Horse Chesnut; the beautiful *Cytissus* on the common Labur-

num; and many other extraordinary changes may be made in grounds already well dressed. I passed a common hedge row not long since, of at least a hundred yards. It had been neglected and grown tall; every half rod or so good young heads were left standing, while the hedge was shortened at least four feet. These, on enquiry, I found were to receive grafts of all the best varieties of Thorn and *Mespilus*; if so, they will form a pretty row of trees next the road, we fear near enough to tempt the spoiler when in flower, but nevertheless making a change in their appearance, much to the advantage of the place. These things cannot be too much known. A friend of mine in Shropshire has, not so wisely I think, grafted about twenty kinds of Pears in a hedge row; and though the passers-by might respect a flower, the fruit is always too tempting, and he never gets one ripened, nor indeed forward enough to gather and ripen in the house.—C. T. HERBURN.

**FLORISTS' FLOWERS.**—What are Florists' flowers? asks everybody who does not pay proper attention; and the answer might be very short—for we might say, and truly, whatever the Florist pleases to adopt. But there are some points necessary to constitute properly Florists' flowers. First, they ought to be capable of being produced from seed; secondly, when produced, they ought to be capable of being propagated by cuttings, layers, or offsets; thirdly, they ought to be capable of being named and grown in collections, from the number of distinct varieties in their flowers. This, therefore, banishes annuals; for however beautiful annuals may be, and however much they may be improved, there is no certainty of producing the same variety from seed, and therefore all distinctiveness is temporary—the finest in the world is lost in one season; and although seeds may bring them good again, and as good, perhaps, as ever, there is no certainty that one seedling in a thousand will be like the one from which the seeds were saved. The ordinary Florists' flowers, or rather the old ones, were the Tulip, the Hyacinth, the Auricula, Polyanthus, Ranunculus, Pink, Piccotée, and Carnation. These were completely originals. But, in our time, the Pansey, Rose, Dahlia, and Geranium, were taken one by one; and since that the Fuchsia, Petunia, Verbeena, have been grasped, and bid fair to advance, as everything else has, under the Florists' care.

**HYBRIDISING FUCHSIAS.**—Our hopes of improvement in Fuchsias lie in mingling the species that now exist; one flower has one desirable quality, another has another—we wish both these to meet in one. This can be obtained by hybridising or fertilising the seed-

vessel of one flower with the pollen of another. To do this regularly and systematically I proceed thus :—I get a small box about two inches deep and a foot square, and I divide it into twenty-four compartments ; into each of these I cut a small quantity of worsted thread into pieces about two inches long each. The worsted of each compartment is of a different colour, and each colour I use to represent a Fuchsia ; for instance, white represents *Venus Victrix* ; orange, *fulgens* ; blue, *Formosa elegans* ; black, *Exoniensis* ; and so forth. Having my worsted ready, I take my box into the greenhouse, and proceed thus with my operation :—I choose a Fuchsia for a female to bear the seed. I examine the plant till I find a perfect flower, newly opened, before the anthers have burst and discharged any of their pollen. I carefully cut off the anthers, and I then select the plant by which it is to be fertilised. I find on it a flower which has its anthers covered with pollen ; I pull this, and with it I dust the stigma of the prepared flower, around whose flower-stalk I tie a piece of worsted of the colour that designates the male employed. When I gather the seed, I know by the colour of the worsted at once how it has been fertilised, and I place the seed-vessel in paper boxes to dry, carefully marking on each the names of the male and female parents. In spring I sow the seeds in separate pots, with labels stating particulars ; and by this means I hope clearly to ascertain the true result of my experiments, which never could be done if I were to sow my hybridised seed at random. In such case I might obtain a beautiful specimen—I might get excellence of foliage or habit, or size of flower, but here I stop : I could learn nothing further from my success ; I could obtain no insight into the means by which I had already succeeded, or was likely to succeed hereafter. In my experiments I have certain objects in view ; I want, for instance, to unite the colours of *Venus Victrix* with the size of *Exoniensis*. I wish to have *Eppsii* with a deep blue corolla, and *fulgens* with a pale pink or white tube. I cross these with varieties having the qualities I desire ; for instance, I cross *Venus Victrix* with *Exoniensis*, *Eppsii*, and *Toddiana*. Each plant is used alternately as male and female. My object is to retain the colour of *Venus Victrix*, but to increase the size of the flower. I do not expect to succeed in one year. I find, perhaps, in one plant the tendencies I wish ; I pursue my advantage, hybridise this again, and have no doubt of ultimate success. All my experiments I carefully note down in a register, for I have no doubt I shall meet with results I by no means expect ; and by knowing how they came, I shall be able to

use them to advantage.—*Cavanensis*.—*Gardeners' Chronicle*,

**STEEPING SEEDS.**—Amongst the various steepes for accelerating vegetation, I have not seen chloride of lime mentioned in your paper. Some time ago I heard from a friend in Germany of its efficacy ; French beans steeped four hours in a solution of a quarter of an ounce of chloride in a gallon of water, were up and in rough leaf before others sown at the same time were above ground, and an equal difference was observable with other vegetables.—*Lusor*.—*Gardener's Chronicle*.

**THE COLOURING MATTER FOR PLANTS**, called chromule, is contained in cells protected by the epidermis, or thin transparent covering of the surface, which, by its transparency, permits the colour to be transmitted. It is chemically composed of carbon, in large quantities hydrogen, and a small proportion of oxygen ; it is found in the leaves of plants, and proceeds from the carbon fixed by the decomposition of carbonic acid ; its colours in this situation is green, and as such it may be considered as carbon, presented by the vegetable kingdom in its least degree of combination with oxygen. Many leaves change their colour at the approach of winter, and frequently assume a bright red appearance (as is the case with the Virginian creeper), a circumstance caused by their having ceased to fix carbon during the day, but continuing to absorb oxygen at night. This condition, then, may be assumed as carbon, or chromule, in its least amount in quantity, under its highest state of oxygenation, and is most frequently met with in flowers whose functions (the reverse of that of leaves) is to part with carbon, whilst they absorb oxygen. We have in these examples the colouring principle of plants (carbon), presented under its two most opposed conditions, namely : in an abundant quantity, and little oxydised, assuming a dark green colour ; whilst, in the opposite state, there exists only a small proportion, but at the same time it is exhibited in its highest degree of oxygenation, appearing as a bright red.—*Medical Times*.

**EARWIGS** endeavour to get into the dark, hence bean stalks, lobster claw shells, inverted flower pots, and all other receptacles which will afford them shelter in the dark are effective traps. The principal cause of many persons being plagued beyond measure by swarms of earwigs, is neglect of beginning to destroy them early enough. *Dahlia* growers especially pay the penalty of delay. If they would, at the time they plant out, put an inverted flower-pot with some moss tucked into it on a stick, about the height of the plant, and examine them as anxiously as they do

when the blooms are coming, they would be entirely freed from them long before the flowers appeared; but no, (as one of our best growers and dealers says of something very different to earwig killing, "Time enough yet,") time enough yet, is the cry till the earwigs literally swarm, and the buds are eaten before they show colour. Those who begin early find perhaps only one earwig among ten pots, perhaps only one in twenty, but it is killing a regiment, and those only will be free from the annoyance who do thus kill early, and never allow them to go a head.

**THE TULIP.**—There would be many more Tulip growers, if it were not for the expense of a stage, without which even a good bed appears nothing, and lasts but a short time in flower. But everybody who grows Carnations ought to grow a bed of Tulips, because the awning that does for one does for the other. As a hint worth attending to, I would mention that, if the awning is made waterproof, there must be a complete ventilation at top, and this is easiest managed by a three-cornered opening at each end, immediately under the ridge itself.—A. B., Reading.

**DESTRUCTION OF VERMIN.**—Many are the proposed means of destroying vermin; and the most simple and efficacious is the least used, because it is the most simple, for we can find no other reason. It is not a universal remedy, but it is useful and efficacious with ants, the worst pest we know of; wherever there are wood-lice, and many other creeping things abounding, make holes with a crowbar, two, three, or even four feet deep, but not large, and quite perpendicular; the creatures crawl and fall into these traps, from which they can never get up again, and we have, after one of these holes has been open a fortnight, had the curiosity to dig down carefully, and found wood-lice, earwigs, caterpillars, and other insects in vast numbers. We have known ants to be cleared from hot-beds, stoves, and beds or clumps where they have accumulated beyond endurance, by merely making holes as deep as the soil would allow. And in the absence of a crowbar, a strong smooth stick must be used, but it does not make the sides of the hole so smooth as a crowbar or iron rod, nor does it operate so easily, nor come out so well without disturbing the soil, as a crowbar.

**THUNBERGIA CHRYSOPS.**—It is seldom such a combination of beauty is met with in any single individual of the vegetable kingdom, as is presented to the admiring eye of taste in this instance. A blue *Thunbergia*, it is true, is not so startling a novelty as was the blue *Nasturtium*; but those we already possess of the colour are extremely objectionable; the one

on account of its rambling uncontrollable habit, and the great paucity of flowers by which it is distinguished; and the other for its debilitated sickly character, which renders it very difficult to keep in existence, the production of a plant in anything like a healthy condition or a free-flowering state being something near an impossibility, a feat that has never yet, we believe, been achieved. In the plant before us, however, we have all these objections met in the most satisfactory manner; a habit of the most happy medium description, neat and compact, yet sufficiently robust to satisfy the most fastidious, uniting with a free development of large and lovely flowers. We do not often indulge in such unqualified praise; but really it seems to us a most unenviable and difficult task to point out a blemish in this truly fine thing. *T. chrysops*, although in strict terms a climbing plant, partakes also of the aborescent form to a much higher degree than is observable in any other member of the genus, so much so, that, by some attention to the removal of the points of its leading shoots, it may be made to assume an erect and decidedly shrubby character; indeed it is not until the plant has become established, and attained a considerable stature, that, in the majority of instances, it displays a tendency to climb at all. This is an advantageous trait that cultivators must not overlook; for thus, it will be seen, it may be made to group with collections of plants of the ordinary description, or among climbers alone, and yet preserve a proper keeping with either: the importance of this, where the allotted space is limited, must be obvious. In cultivation, the plant, although naturally an inhabitant of the torrid climate of Sierra Leone, does not seem to insist on the high temperature we might be induced to believe necessary from its native location, an ordinary stove appearing sufficient to produce it in great luxuriance; and we are inclined to believe a much lower temperature than even this will be found enough. *T. alata*, another Indian species, grows and flowers extremely well when exposed to the full influence of our summer weather; and we shall not be surprised, in a few seasons, to find them growing side by side in the same situation. Seeds of this plant were received from Sierra Leone by the Right Hon. the Earl of Derby, from which plants were raised at Knowsley Hall, whence it was sent to the Royal Botanic Gardens at Kew; and through his Lordship's liberality, and that of the management at Kew, it has since been pretty widely distributed among the more eminent growers throughout the kingdom. We are indebted to the kindness of J. H. Schroder, Esq., of Brixton, for the opportunity of figuring it; in whose collection the



plant from which our drawing was made, flowered in September last. We find it grow rapidly and strong in a mixture of rough peat and leaf mould; and as the spread of roots is fully equal to the quick advance of stems and leaves, it seems to require a considerable space to admit of a free and full developement of these organs. It is readily increased by cuttings in the usual way; and, so far as we have opportunity of forming an opinion, it promises to bear seed abundantly. This feature will recommend it to the attention of those who can bestow the necessary care, and who delight in that pleasing and wonderful operation, hybridizing. To our mind it presents a most promising chance of producing something thoroughly good and distinct. A blending of the purple of this with the orange, yellow, white, or scarlet of other species, must, we think, produce some startling results.—*Florists' Journal*.

**HINTS TO AMATEURS.**—Bulbs of all kinds ought to have been all planted long since, as directed before; but if any, from carelessness have been left out, or have come into your possession late, or you should be tempted by a bargain to purchase any of the remaining stocks at the shops, get them in directly either in the borders or pots, but the borders or beds would give them the best chance. I have planted a bed of Tulips on the 11th of January, when they had speared about two inches of the green the fibres had started full a quarter of an inch, and they were covered with aphides. I dipped every one separately into lime water, which settled accounts with the green fly, and I had hardly a miss bloom; but the foliage was spotted, the roots came up much smaller, and some had split into offshoots. I would never keep a tulip out of ground from choice, after the skin burst or the shoot began to show. However, if by any chance you have bulbs out of the ground, lose not an instant in getting them in, and if the fibres of the root have shot, water them in, and cover them up for a week or ten days, that the frost, however severe it may set in, does not reach the ground. This applies to the Jonquil, Narcissus, Crocus, Lily Iris, Gladiolus, Fritillaria, Crown Imperial, Pancratium, Hyacinth, and all other bulbs. Some may still bloom in glasses, but there is nothing like a fair chance of doing well.—Flowers and Plants for forcing should be put into the hot bed or forcing place. My forcing house was a common hot bed, with a frame two foot six right behind, and one for three in front. These plants are to succeed those already forward, if there have been any. The Hyacinths that have been buried in pots may some of them be removed to the bed. A few at a time will keep up a moderate bloom for a

considerable period. They will rapidly come into flower after having been potted in November, because their roots have been making or establishing themselves the whole time.

**FUCHSIAS.**—Perhaps it may not be generally known, that at this season, when Fuchsias have done flowering, if the strong shoots are divested of their lateral branches and tops, and packed in powdered charcoal, or perfectly dry earth in boxes, and placed out of the reach of frost in a cool place, they will retain their vitality until next April, when they may be cut into lengths of about a foot long, and planted with a dibble; insert them into the ground so as to leave about three inches of the cutting above the surface in any place where they are wanted to flower next summer. If kept tolerably moist they will be found to make good flowering plants with little trouble, and to any extent that may be required; the sorts that I have tried are Globosa, Globosa major, gracilis, virgata, and conica; they were packed in powdered charcoal on the 27th of October, and planted on the 6th of April. They flowered very well.—A. C., *Gardeners' Chron.*

**VIOLETS.**—The great variety of these plants may be estimated a little near the mark, by the fact that Paxton names between twenty and thirty blue ones, above a dozen purple, more than a dozen cream and white, about fifteen pale blue, nearly the same of yellow, besides a large number of striped, dark, and other varieties—of these only three or four are greenhouse kinds; the rest are hardy; perhaps a dozen would comprise all that a florist would care to grow.

**SLUGS.**—Lay cabbage leaves down near the place where they abound, and take them up once in twenty-four hours. If you happen to be burning weeds, and can half roast them they seem to attract the slug still more, and they will in either case be found on the under surface of the leaves in great plenty, each day, however, they will become more scarce, and at length they will be got rid of. If they come from a hedge or bank, where they always lurk in great plenty, it will be well to water all the bottom of the hedge with strong lime water, that is, water with as much lime in solution as it will take up, where this reaches them it soon settles their business, but the laying down of cabbage leaves will thin their ranks amazingly; half-a-pail full of salt and water should be had to throw them into as they are caught, and they should be thrown into the rubbish hole; by sprinkling lime round the place to be protected they may be prevented from doing any mischief.

**GRAPES.**—There can be no doubt that vineyards once existed in Great Britain, and the grape still ripens occasionally out of doors, as

in Worcestershire and Hampshire, as well as other counties; and, if my memory does not deceive me, a variety called Miller's Black Grape, has ripened on an exposed south aspect, even in Scotland. A North American traveller informed me that he once found a wild, hardy, black grape in the woods of that cold climate, and entirely ripe—such a vine would indeed, be an acquisition. Many years have now elapsed since Dr. Hastings, of Worcester, adverting to two distinct parcels of grapes on his dinner table, informed me that they were taken from the same vine, cultivated in the open air, on a south wall; the grapes in the one case were small and immature, the other large, well formed, entirely ripe, and fine flavoured. The former were cased in white envelopes, the latter in black crape bags.—J. MURRAY, *Dec. 26, 1843.*

**GERMAN DOUBLE WALL FLOWERS.**—Popular prejudice has set down the Double Wall Flower seed of the Germans as a fallacy, but practice—and there is nothing like it—has decided that there is such a thing as seed that brings Double Wall Flowers, and a new race of Wall Flowers has been fairly introduced. The plants grow tall, the spikes of flowers long, the bloom rather enduring, and of odd colours; but they are not the same kind of double flower as we are used to, they are more of the nature of a double larkspur, and bears seed, which in their turn bring double flowers again. It is worth trying a pinch of this seed.

**WAITE'S NEW PEA, QUEEN OF THE DWARFS,** has been grown in the Royal Gardens at Frogmore, and placed on the Queen's table, since which the owner has been honoured with an official letter, announcing Her Majesty's approval, in flattering terms, so that it may be said to have established a character at starting.

**THE MYRTLE.**—The ancients made great use of this plant in medicine, and they formed a kind of wine from the berries, as well as an oil which they extracted from the ripe fruit of the myrtle. The Romans flavoured their wine with the berries, as well as many of their dishes in cookery, before the use of pepper was known to them, and even then it was in high estimation for making sauce to the wild boar. The Italian ladies still consider the tree of Venus to be favourable to beauty, and drop into their bath a water distilled from the leaves, whose fragrance they prefer to the most costly essence of the eastern nations. The Myrtle is said to have been introduced into England from Spain by Sir Walter Raleigh and Sir Francis Carew, in 1585, when they resided in Spain and discovered the preparations making for the Spanish Armada. Miller tells us, in the first edition of his dictionary, printed in 1724, that

"at Sir Nicholas Carew's, at Beddington, in Surrey, is a Myrtle of the Spanish broad-leaved kind, which is above eighteen feet high, and spreads above forty-five feet." If this were the original tree, it would then be 156 years old, and most probably perished with the original orange-trees that were killed by the severe winter of 1739-40.

**CROPPING UNDER FRUIT TREES.**—Some of the writers, Mr. Loudon among the rest, condemn the cropping under fruit trees, and recommend laying it down on grass. They give chapter and verse, with many reasons for their advice, and all of it reads very well, and sounds very rational, but practice is against it. The finest orchard fruit that is produced at market comes from the market gardens, where for half a century the ground has been heavily cropped every year, and has been constantly kept well cropped. The fact is, the air can reach the roots. The manuring for the under crops does its work for the fruit trees as well, and the proofs of its efficacy may be found in the fine fruit which the trees, when properly pruned, produce, gives the most perfect contradiction to the recommendation of writers to lay it all down in grass.

**THE IVORY PLANT.**—The kernel of the Ivory Nut (*Phytelephas Macrocarps*) though hard as Ivory when mature, is occasionally penetrated by some insect, perhaps a curculio or cynips. I have seen a specimen completely scooped out—a mere shell of ivory remaining,—the insect having entered by a circular orifice of about the 18th of an inch diameter.—Vegetable Ivory is not so liable to warp by the agencies of heat and moisture as that of the animal tusk.—J. MURRAY, *April 26, 1843.*

**GRAPES ON OPEN WALLS.**—I have been cultivating several kinds of Grape according to your treatise in the early part of this volume, which was published separately in January, and I can safely say, I never succeeded in the most favourable season so well as to quality, appearance, flavour, and quantity, (by weight) as I have this season.—Your's, T. B.—*Clapham.*

**ANEMONES.**—I have succeeded in producing two distinct rows of petals in many varieties, from seed saved 1843, but there are many which have not bloomed. I observe also, that the colours are exceedingly vivid; I have destroyed the single ones the instant they showed themselves enough for me to discover what they were, I have seeded from the double petalled flowers, and sowed a pair in boxes. Your's, M. D., *Reading, Berks.*

**HYBRID FRUITS.**—I wish your readers would, the next fruit season, apply the pollen of one kind of pear to another, and one kind

strawberry, apple, plum, peach, nectarine, &c. and especially watch the product, to observe whether there be any manifest difference in the fruit of the same year, of course there is no doubt about the seed, proving ultimately different, but I strongly suspect there will be a very great change come in the fruit. It can only be well done by trying fruits of an opposite character, at least in size.—F. B. *Slough, near Windsor.*

**MR. HOARE'S VINE BORDER.**—Mr. Hoare, in his recent Treatise on Vine Borders, has especially drawn our attention to this important point more than any other writer on the same subject, and on that account deserves our thanks. Perfect drainage, and the exclusion of long continued rains, has been well understood by our best practical gardeners; but I think the exclusion of soil entirely from forming any part of the material necessary in the formation of a compost for the roots is a new doctrine, and an assumption opposed to our knowledge of horticulture, both practically and theoretically. The Vine may like to ramble amongst stones, lime rubbish, and such like, but our experience of the nature and habits of this plant is, that it delights in rich pasture, especially when subjected to the artificial treatment and temperature it usually undergoes, to produce such magnificent fruit as we annually see exhibited at the *fêtes* in the garden of the Horticultural Society. Soil intermixed with a portion of manure, will be more likely to attain the result just stated, than the absence of both. This may be considered mere prejudice; theory is all very well, but good practice with me has the preference. It is a question of some importance, and worth ascertaining, whether Mr. Hoare ever has produced by his system of prepared borders, grapes superior, or even equal to those we witness every year at Chiswick, and which we know are the result of the old repudiated manured borders: for, after all, this is the question. Mr. Hoare is surely aware that the grapes produced in this country in our vine-ries are not only equal, but, in the great proportion of instances, superior to those grown in the latitudes where the Vine is extensively cultivated, to which Mr. H. so often refers. I shall say nothing respecting Mr. H.'s recommendation of paving the border with brick or tile; we old-fashioned gardeners like to keep stirring the soil.—R. G. — *Gardeners' Chronicle.*

**ORNAMENTAL SHRUBS AND FLOWERS.**—Mr. Colman, in his paper on European Agriculture, publishing in the *Farmers' Magazine*, observes—The cultivation of Flowers, and Shrubs, and Vines, is a remarkable and prominent feature in the Landscape of England, and a circumstance which has given no little

gratification to my national pride, has been the profusion of American plants, azalias, and kalmicas, magnolias, and rhododendrons, and a large variety of pines and firs, which are seen in the shrubberies, and plantations, and pleasure-grounds, both public and private. Greenhouses and conservatories are almost universal in the country, where anything like the garden exists; and the better class of houses are surrounded and adorned with a great variety of flowering shrubs and plants, presenting through the season a charming succession of gay and brilliant ornaments. Even the labourer's humble cottage will occasionally have its flowering shrubs adorning its door-way, and the ivy hanging its beautiful tresses over its window, forming, as it were, a mirror set in a frame of the richest green. The village of Marr, in Yorkshire, not far from Doncaster, and the village of Edensor in Derbyshire, near Chatsworth, and the village of Lord Brownlow in Lincolnshire, the best built, and by far the handsomest villages I have yet seen in England, to cottages of an excellent and picturesque construction, monuments of the liberality of their proprietors; add to these beautiful rural embellishments of vines, and shrubs, and flowers, and at first blush compel a reflecting mind to admit the moral influence of such arrangements upon the character and manners of their inhabitants. Churches and ruins likewise are often seen, spread over with the richest mantlings of joy; and, among many others, the venerable and magnificent remains of Hardwicke Hall, for example, are covered, I may say, in the season of its flowering, with a gorgeous robe of it, matting its sides with indescribable luxuriance, climbing its lofty battlements, and fringing its empty windows and broken arches, as though nature would make the pall of death exquisitely beautiful and splendid, that she might conceal the hideousness of decay, and shut from the sight of frail mortals those affecting monuments of the vanity of human grandeur and pride. I have seen and written a great deal to my countrymen about the cultivation of flowers, ornamental gardening, and rural embellishments, and I would read them a homily on the subject every day of every remaining year of my life, if I thought it would have the effect which I desire of inducing them to make the matter of particular attention and care. When a man asks me what is the use of shows and flowers, my first impulse always is, to look under his hat and see the length of his ears. I am heartily sick of measuring everything by a standard of mere utility and profit; and as heartily do I pity the man who can see no good in life but in pecuniary gain, or in the mere animal indulgences of eating and drinking.—COLMAN.

**DESTRUCTION OF THE GOOSEBERRY CATERPILLAR BY SALT.**—To destroy the green worm, as also the small orange-coloured aphides, which often injure the bushes and destroy the fruit, we sprinkle the plant with salt and water early in the spring, before the leaves are developed; the mixture may then be made so strong as to whiten the branches, without affecting the future crop. Should the leaves or buds be in part expanded, the brine should be greatly reduced, say one quart of salt to about eight gallons of soft water, applied over the bushes from the nose of a watering pot.—*Honey's Magazine of Horticulture*.

**FIRST AND SECOND-CLASS FLOWERS.**—A first-class flower is not necessarily a perfect flower. The terms are not well understood. A first-class flower is a flower worthy to take its place among the best. Their standard of perfection was a first-class flower, because it was in some of the properties superior to almost, if not quite, every variety in existence. The sunk eye, which is a fault almost universal among deeply-cupped varieties, does not prevent it from taking rank, because that is the only property of which it is deficient. Nonpareil is a first-class flower, because if it does not come up to the standard in the closeness and clearness of the petals, it possesses all the properties above the average. The term should be understood to convey the notion that a flower may be placed among the best dozen in the best condition. Second-class flowers are those which do not come up to the standard perfectly in any one, and especially in the compactness and symmetry; the outline being indented, the shoulder being too high, or the side too square, the petals too large or too long, or too wide apart, are all faults which throw a flower into the second class, and if conspicuously so, throws it out altogether, but any two or three properties of good average quality would save a flower and place it in the second class. When we have a few more flowers as good as the standard, first-class flowers will go down to second, and second will be thrown out, so that we shall still have first-class flowers which will be among the very best, and second-class flowers which may be considered good enough for show, but not in the first rank; nevertheless, people must not expect when they hear of a first-class flower, that they are to find something superior to all we have besides.

**DAHLIA STANDS.**—While this favourite flower is fresh in the minds of the exhibitors, we wish to offer a few words upon the careless manner in which many people set up their collections. They totally abandon uniformity; they pay but little attention to variety, and seem utterly regardless whether the eye is a

confused mass of petals half opening, or a close symmetrical centre. But above all, they labour to keep all the flowers the same size, which is not a jot in favour of a stand. The back row may be larger than the second, and the second larger than the front, so that the flowers in each row are perfectly even sized. The endeavour to produce them all of a size prevents many beautiful compact flowers from being exhibited until overgrown, and hence the numerous instances in which the eyes are blown into confusion, which is hardly a jot better than a yellow disk. We do not say there should be great disparagement in the sizes, but there may be a difference greatly to the advantage of a good stand of flowers.

**PETUNIAS.**—There never was a season in which so much advance was made in a flower as has been made the present year. Almost all our country friends have exhibited extraordinary flowers, some of immense size, some of richly vivid colours, and many of exquisite form. There is scarcely anything more constant in flower, nor longer in perfection, not even excepting the verberna, which is advancing with just such rapid strides. Show after show Mr. Girling, of Stowmarket, has exhibited twenty-four varieties, with all the beautiful variegations of the *Salpiglocis*; round, striped, and edged; they have presented pretty objects, and their value as a garden flower to bed out is great. Sorrel of Chelmsford has shown several, one of which is as large as a middling-sized funnel, we think we are quite within bounds in saying, from three to four inches across. Miller is advancing, and many others will have novelties to offer at the proper season, that will be great additions to the present collections.

**REPTON, THE LANDSCAPE GARDENER.**—Perhaps there is no stronger proof of Mr. Repton's love for the beauties of nature, than the wish he had latterly expressed, that his remains might be deposited in a "garden of roses." To gratify this innocent fancy, he himself selected the small enclosure on the south side of the picturesque church of Aylsham, in Norfolk: a simple Gothic monument records his name and age, followed by some lines written by himself;—

"The tomb of Humphry Repton, who died  
March 24th, 1818.

"Not like the Egyptian tyrants—consecrate,  
Unmixt with others shall my dust remain;  
But mouldering, blended, melting into earth,  
Mine shall give form and colour to the rose;  
And while its vivid blossoms cheer mankind,  
Its perfumed odour shall ascend to heaven."

In the same grave reposes that gentle being, who, for five-and-forty years, had been the beloved participator in all his joys and griefs;

she did not long survive him, and it was her last request that they should not be separated in death. Out of a family of sixteen children, but seven reached the age of manhood; and at their parents' death only four sons and a daughter remained of this numerous family. The latter still resides with her eldest brother, John Adey, who is, perhaps, less known as a follower of his father in the art of landscape gardening, than as one deeply versed in antiquarian lore; from which peculiar taste he has gathered an accurate knowledge of ancient Gothic architecture, many specimens of which are to be found in the engravings that accompany his father's works. The second son, Edward, who was originally intended for his father's profession, having evinced a preference for the church, was sent to Magdalen College, Oxford, and is now a prebendary of Westminster. The third son, William, is in the law, and possesses the small paternal estate at Aylsham; and the fourth son, George Stanley, who has for many years practised as an architect, married the eldest daughter of the late Lord Chancellor Eldon, only a few months previous to the death of his father. One of the most ardent wishes of that father's heart was gratified, by living to see his children united and happy; and we cannot better close this notice, than by transcribing his own concluding words, so expressive of the ruling feeling of his mind:—"My ship of life is sinking, and it is time to quit it; these pages will serve to show how actively I have performed the voyage—how I have glided through calms, and struggled through tempests. I have touched at every port, and where have we met with happiness unalloyed? or, where found a man not disappointed? Nowhere! Yet still I must repeat, that there is more of good than of evil; and for this redundancy, all our gratitude must, at last, resolve itself into that reiterated aspiration from my heart—*Laus Deo*." J. B.

**BETTER AND THEIR DESTRUCTION.**—Dr. Horner of Hull, a very intelligent contributor to the *Chronicle*, recommends *potatoes and arsenic* as the most effectual means of the destruction of beetles. We have tried it in our house with the most triumphant success, and now, I may say, we have not one. This is certainly "a secret worth knowing;" and I therefore speak advisedly, when I add *probatum est*.

**SANDAL WOOD.**—The Gates of Somnauth have given an eccentric interest to Sandal Wood (*Santalum Album*). The most esteemed, it is curious to remark, comes from the island of Juan Fernandez, the celebrated scene of Daniel de Foe. I have various specimens of Sandal Wood; but, certainly, the finest I possess is a specimen presented to me

by Admiral Page, and brought from Juan Fernandez. It is very fragrant.

**LAUREL AND MYRTLE BERRIES.**—Although the leaves of the Laurel are known to be poisonous, from the presence of *hydroganic* (Prussic) acid; I find that gypsies use the berries for food, and make them into tarts. In walking, *en route*, from Civita Vecchia to Rome, in the year 1818, I perceived that my *compagnons de voyage* replenished their pockets with berries from the Myrtle hedges, and seemed to relish them amazingly.

**THE PÆONY.**—For the information of persons beginning to form a small collection, I beg to notice a few sorts well worth growing. *Barterii*.—Single, glossy, crimson, beautiful bright yellow centre, and finely cupped. *Foliosa*.—Light crimson, fine foliage, very fine. *Lobata*.—Neatly shaped, pink, single. *Officinalis Carnesens*.—Splendid crimson, rich centre, single, very fine. *Pallida*.—Elegant shape, deep and broad flower, of a very delicately shaded pink colour; quite a gem, and should be in every garden. *Officinalis Albicans*.—After the same style as the preceding, "alike, but different," not quite so large a flower. *Albiflora Chinensis*.—Is quite unique, and perhaps one of the very best yet in general culture; it may not be irrelevant for me to say here, that this plant has elicited more praise than any hardy plant in my small, but select collection; its fine foliage, neat habit, and pure white flowers, render it an object of universal admiration to all who have seen it. I was rather amused at the expression of a Lancashire florist, who called upon me a few days since, a man who could only be eloquent upon the auricula and tulip. "I pity any man's taste who can cultivate geraniums or dahlias, but truly that is a fine plant, and worth growing." It had seven fully blown flowers, of from seven to eight inches in diameter, and was quite attractive to unsophisticated taste, as to more aged cultivators; this digression is made, having omitted it in the proper place, to show the unfounded nature of the supposition that they are unfit for small neat gardens. *Humei*, *Fragrans*, and *Odoratissima*.—are finely shaped, the two latter finely scented, and the three are indispensable to collections, if only of moderate pretensions. The colour is variously shaded, rosy, and lilac. *Potsii*, and *Rhevesii*.—Are new and well worth growing; the flowers of the former are neat, and of a pretty light pinkish colour—the latter is of a rich crimson. I hope I have not been more lengthy than the importance of the subject demanded, and that your readers will have no objection on a future occasion to follow me into a further account of a most interesting section of this family, viz., the Moutan or Tree Pæony.—B. Cornwall.

**THE CYCLAMEN.**—*Cyclamen Europæum* blooms in June, and is very fragrant. Knight, some few years back, imported a bushel or two of the tubers, few of which are now alive, as it is very difficult to grow, particularly near London. The whole of the species are beautiful, and the above, as well as *Coum* and *Vernum*, are hardy; the two latter I have had for some years growing in beds, and they stood the hard winter of 1838, with only a very slight covering. The first time I saw *Coum* growing in the open ground was at Knight's, but they were planted too sparingly. If planted about an inch and a half or two inches apart, they form a mass of leaves and blooms in the early part of the spring, than which nothing can be more beautiful. It is extraordinary that the nurserymen about London do not exhibit *Coum* and *Vernum* in beds, as I have described; it would cause some outlay at first, perhaps, but it would ultimately pay them; for few gentlemen possessing extensive gardens would resist the temptation of having a bed of them, if they ever saw them growing. On lawns, the beautiful dark foliage would form for six or eight months in the year, a good contrast to the light green of the grass, and, when in bloom, the scarlet flower makes a most brilliant and gay appearance. The following appears in the *Botanic Garden*, with a figure:—**CYCLAMEN EUROPÆUM**—**EUROPEAN CYCLAMEN.**—Native of Switzerland; height, 3 inches; flowers in August; duration, perennial; introduced in 1832. The plant which we now figure was supplied to us by our very liberal friend, the Rev. H. T. Ellacombe, of Bitton Rectory, who, in his letter, says, "I imported it from Holland in 1832, ever since which it has stood out, unprotected,

in the pot in which it is now growing, plunged in the border." The plant has long been known, or rather heard of, amongst botanists; for Miller, in his *Gardeners' Dictionary*, slightly notices it as *Cyclamens radice anemones*. Its prominent distinction from all other species consists in its root, which, instead of being a round tuber, resembles that of an anemone. We have sought in vain for other distinction between it and *Europæum*, and this we hold to be insufficient to warrant their separation as distinct species.—W. C.

**MANURE HEAPS.**—The difference of value, whether a manure heap be left in the ordinary way, or whether it be covered over with road scrapings, sand, coal ashes, or even with the soil at hand, is estimated at upwards of 50 per cent. in favour of this system. The object to be attained is to preclude the gaseous properties of the manure from escaping. It is stated that salt water, poured over the dung heaps, will fix the ammonia; if so, the end is very readily attained.

**AMMONIACAL VAPOUR.**—I have not long ago witnessed the decidedly good effects of the ammoniacal liquor of gas works on the vine and kidney beans—the leaves of the kidney bean that were near to the vessel containing the liquid were withered at their edges; which I am inclined to attribute mainly to the sulphuretted hydrogen emitted at the same time. The following simple method will get rid of the latter noxious impregnation, and secure the full effects of the ammoniacal vapour:—plunge a piece of quicklime into the ammoniacal liquor, remove it, and the lime will then evolve pure ammoniacal gas. Other atmospheric impregnations I will again mention.

